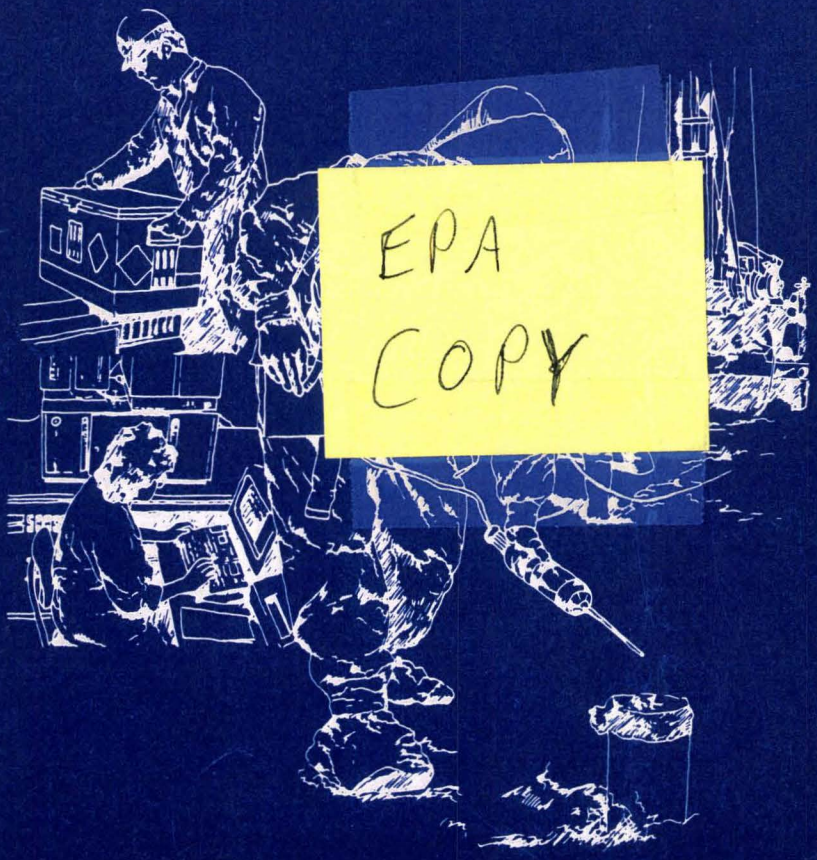
EPA

HAZARDOUS
SITE
EVALUATION
DIVISION

Field Investigation Team Zone II



CONTRACT NO.
68-01-7347

ecology and environment, inc.
International Specialists in the Environment

Final Report
EPI/Preliminary Assessment
Drew Industrial Division Inc.
(Ashland Chemical Company)
(Olin Water Services)
Kansas City, Kansas
TDD #F-07-9003-005/PAN #FKS0285RA
Site #T98 Project #001
Prepared by: E & E/FIT for Region VII EPA
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Date: October 22, 1991

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SECTION 1: INTRODUCTION

As part of the United States Environmental Protection Agency's (EPA) Environmental Priorities Initiative (EPI) Program, Region VII EPA has requested Ecology and Environment, Inc., Field Investigation Team (E & E/FIT) to conduct an EPI Preliminary Assessment (PA) of the Olin Water Services-Olin Corporation located at 305 Sunshine Road, Kansas City, Kansas. Recently, the Olin Water Services Branch was purchased by Ashland Oil, Inc. The facility is now named Drew Industrial Division (Ashland Chemical Company), a subsidiary company of Ashland Oil, Inc. However, for purposes of this EPI-PA, the site will be referred to as the Olin Water Services.

The EPI Program integrates the Resource Conservation and Recovery Act of 1976 (RCRA), the Hazardous and Solid Waste Amendments (HSWA) of 1984, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the Superfund Amendments and Reauthorization Act of 1986 (SARA) in order to set priorities for the cleanup of the most environmentally significant sites first. This EPI-PA is essentially equivalent to RCRA's Preliminary Review/Visual Site Inspection (VSI) and identifies potential or actual releases at the facility and determines if remedial measures are necessary.

This report discusses information obtained from the EPA-RCRA, Olin Water Services, and Kansas Department of Health and Environment (KDHE). All solid waste management units (SWMUs) are described in detail. Observations obtained from the on-site reconnaissance conducted by E & E/FIT on April 27, 1990, are included along with site-specific information concerning the physical and environmental setting. Photographic documentation is contained within Appendix A. EPA's PA Form 2070-12 is included as Appendix B.

SECTION 2: SITE LOCATION AND DESCRIPTION

2.1 SITE LOCATION

The Olin Water Services-Olin Corporation is located in the southwest 1/4 of Section 27, Township 10 South, Range 25 East. The geographic coordinates are 39° 08'47" N latitude and 94° 36'58" W longitude. The site is situated at the intersection of Sunshine and Fiberglas roads, in the Fairfax Industrial District, north of downtown Kansas City, Kansas, in Wyandotte County (Figure 2-1).

2.2 SITE DESCRIPTION AND WASTE HANDLING

The Olin facility manufactures chemicals for industrial water treatment facilities. The company's manufacturing process consists of blending approximately 150 different inorganic and organic raw materials (liquid and powder) to produce approximately 250 different water treatment compounds (E & E 1990). The raw materials include solvents, acids, and caustics (Appendix C). The water treatment chemicals produced at the site have various applications ranging from corrosion control in boiling water and cooling water treatments to inorganic coagulants (polymers) in municipal and industrial wastewater clarification treatment processes.

The facility formulates water treatment products on a batch basis; the formulating schedule and amount of each particular product produced depends both on demand and warehouse inventory. The plant facility is utilized on a daily basis. After formulation, Olin performs analytical tests of the batches at its on-site laboratory to assure that product meets specifications; then the product is drummed for shipment or storage. Olin receives and ships both bulk and drummed materials. The amount of shipments can vary daily. It was reported that about 7.5 million pounds of raw materials as well as finished products were shipped and received by the Olin facility in 1989 (E & E 1990). The Olin facility does not receive or ship by rail; however, the railroad off-loading area north of Olin is operational and is used by Owen-Corning Fiberglas Company (E & E 1990).

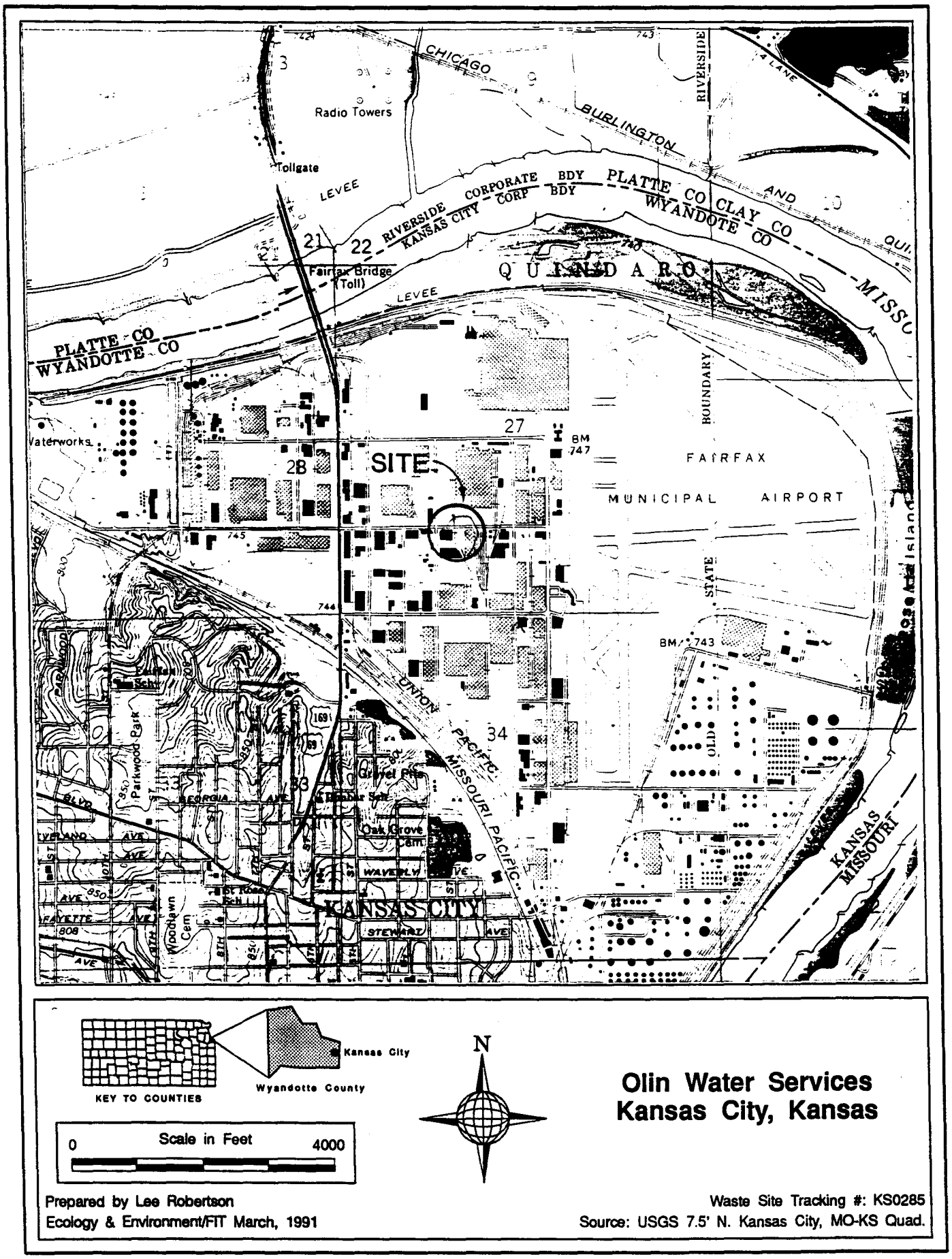

Figure 2-1: SITE LOCATION

Olin Water Services occupies two buildings that are separated by railroad tracks (Figure 2-2). One building serves as a shipping and receiving warehouse for raw materials (unformulated new chemicals) and for finished products. The warehouse also contains some administrative offices. The second building is the plant facility and houses all the chemical manufacturing processes (Appendix A; Photo 1). On a daily basis, raw material and finished products are shuttled by truck to and from the blending areas. An area in the plant facility referred to as the Piece Drum Area also temporarily stores finished product (E & E 1990). These drums remain partially full until the next batch of similar products is made to fill them completely. Full drums of finished product are moved to the warehouse for shipment.

Directly south of the plant building is the production yard, where the company's RCRA-permitted hazardous waste container storage area is located, as well as hundreds of empty 55-gallon plastic drums (Photos 2 through 7). These drums are clean and are stored on four-foot wide pallets, stacked two or three drums high. Two dumpsters are located in the production yard and contain solid wastes such as scrap building materials and empty unusable drums, which have been triple rinsed and crushed. Two product aboveground storage tanks are also located east of the plant; the south tank is currently empty, and the north tank contains sodium hydroxide (Figure 2-2).

The hazardous waste container storage area and production yard is surrounded by a seven-foot high chain-link fence, topped by three strands of barbed wire. There are two gates located on the east and west allowing access for loading and unloading of materials. Generally, only the west gate is open during working hours (7:00 a.m. to 4:30 p.m.). At the end of each working day, the production plant is locked and all access gates are chained and padlocked. For identification of all pertinent site features see Figure 2-2 and Appendix A.

The raw materials that Olin uses and finished products that Olin produces at its facility display hazardous characteristics. Wastes generated during the manufacturing process are from liquid or dry chemical spillage from the formulating drum loading operations and non-reusable rinse water from the formulating process. The majority of non-reuseable rinse water is either recycled as make-up water for

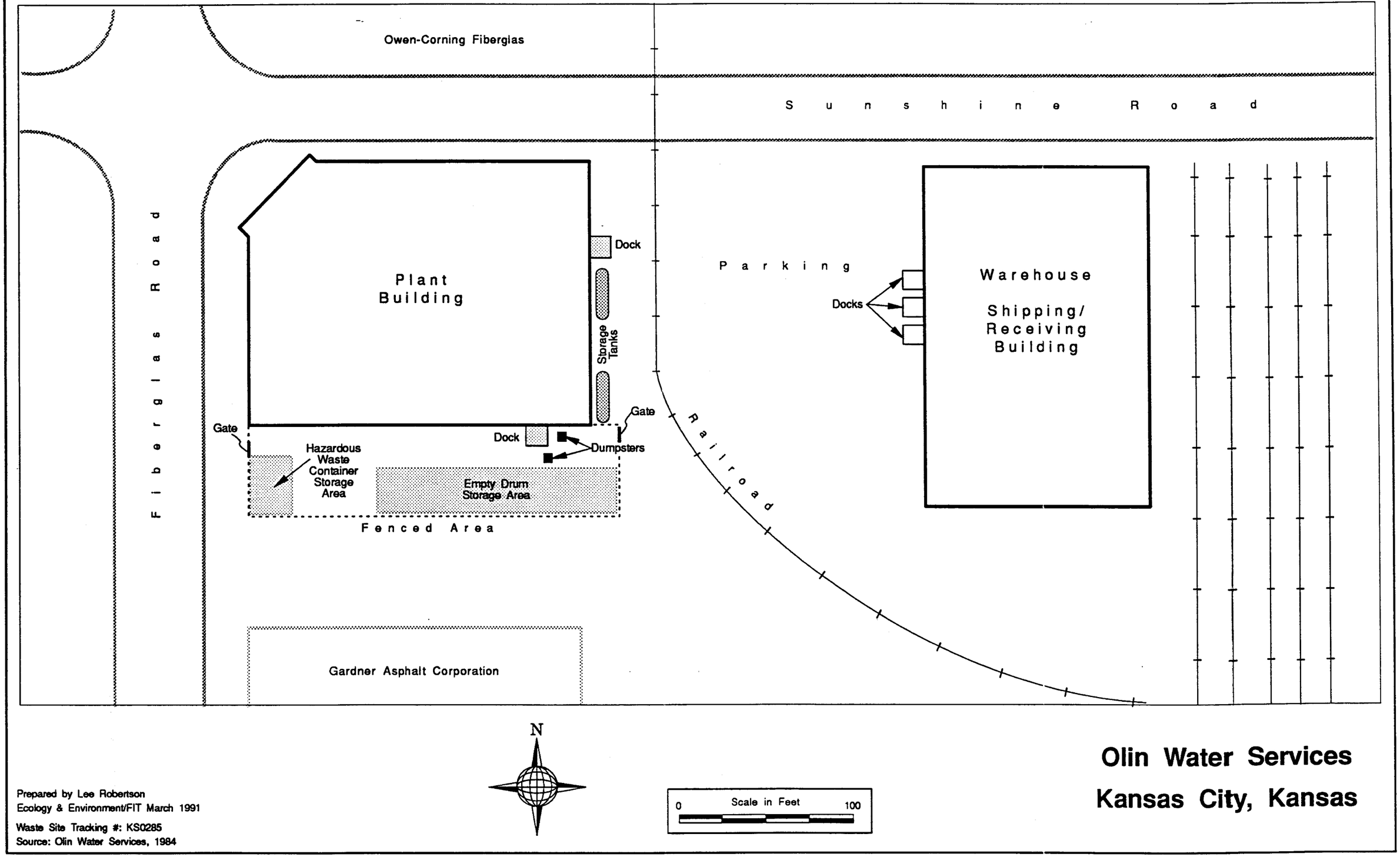

Figure 2-2: SITE FACILITY

succeeding batches or is discharged to the sewer system after neutralization. If determined by analysis to be hazardous, it is drummed and placed in the container storage area (Bosky 1987). Raw material and finished products that are unusable or off-specification are also accumulated, containerized, and stored in the hazardous waste container storage area. The majority of identified waste stored in the permitted container storage area exhibit characteristics of reactivity, corrosivity, ignitability, and/or EP toxicity as denoted in 40 Code of Federal Regulations (CFR), Part 261, Subpart C (E & E 1990). F001 (methylene chloride) is also generated at the Olin's on-site laboratory; however, the waste quantity is minimal. Presently, no F001 wastes are stored in the container storage area. Various U-listed wastes (orthodichlorobenzene, pentachlorophenate) and non-hazardous wastes are also stored in Olin's hazardous waste container storage area. The last entry date in Olin's hazardous waste inventory list for placement of containerized wastes in the storage facility was November 4, 1989 (Appendix D). It was reported that the facility is minimizing wastes by re-using and reworking materials that would otherwise require disposal as a hazardous material (E & E 1990). On occasion, customers return off-specification products to the Olin facility to be reworked.

2.3 SITE CONTACTS

Persons familiar with operations or have regulatory involvement with the facility include:

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SECTION 3: SITE BACKGROUND AND HISTORY

3.1 GENERAL HISTORY

The property at 305 Sunshine Road was used in the 1950s and early 1960s as an electro-circuit assembly plant. In the mid to late 1960s, the property was owned by Deday Chemical Company, which began manufacturing (blending) water treatment chemicals in about 1965. The facility was purchased by the Olin Corporation in 1970, and the Olin Water Services Division commenced operation in 1970. The facility in Kansas City, Kansas, employs about 30 employees including laboratory and manufacturing workers, and distributes water treatment products nationwide.

In December 1989, Olin Water Services-Olin Corporation was sold to Drew Industrial Division (Ashland Chemical Company) (E & E 1990). The facility soon will be re-named and will function as a Midwest Industrial Division regional supplier only (E & E 1990).* Drew Industrial Division plans to remove the two product storage tanks located east of the production plant and replace them with a tank farm, consisting of 16 5,600-gallon to 9,600-gallon storage tanks (E & E 1990). Olin/Drew representatives are also considering expanding the north side of the warehouse. Furthermore, as part of the Drew/Olin purchase agreement, use of combustible/flammable materials and chromium products was to be discontinued at the Kansas City facility (Dame 1990). These products were for the most part discontined about July 1990. Olin supplies about 2 55-gallon drums every three to four months to one customer for use as fuel oil treatment. Finally, under terms of the merger, all hazardous wastes stored in the RCRA-permitted hazardous waste container storage area are to be disposed of by Olin Water Services (Dame 1990).

During the period of 1980 to 1984, the Olin facility operated as an interim status hazardous waste management facility under a RCRA Part A Notification. Activities specified in the notification included storage of hazardous wastes in drum containers. Olin submitted an initial Part B Hazardous Waste Permit Application to EPA and KDHE on March 4, 1983. After numerous revisions and compliance activities, EPA made a tentative decision to issue a RCRA Part B Permit to the Olin Water Services on

September 21, 1984 and issued a public comment period, expiring on November 13, 1984. After an agreement on the contents of the Part B Permit Application, KDHE and EPA granted the Olin facility a final permit which became effective on April 6, 1985. The construction of a drum storage structure consisting of three-sided cinder block walls and covered roof was specified in the permit and completed on August 8, 1985. In 1987, Olin revised the original Part B Permit to include storage of drums by a linear height limitation, with total capacity not to exceed 200 55-gallon drums. This modification was subsequently incorporated into the Olin Part B Permit and approved on February 15, 1988.

In addition to being a hazardous waste storage facility, Olin has been classified as a generator of hazardous wastes from the preparation of liquid and powder water treatment formulations. The Olin Water Services is a State-lead site and under KDHE authority; the Olin facility is classified as a Kansas generator (generates between 25 and 1,000 kilograms of hazardous wastes per month) (Cahoon 1990). Because state regulations are more stringent, the Kansas generator status supersedes EPA's classification of a small quantity generator (1,000 kilograms of hazardous wastes per month).

The ownership, including the RCRA Part B Permit was scheduled to be transferred from Olin Water Services to Drew Industrial Division on December 29, 1989 (Woods 1989). For a more detailed permit and regulatory action summary see Section 3.2.

3.2 PERMIT AND REGULATORY ACTIONS SUMMARY

Following is a chronological history of the compliance history of the Olin Water Services facility.

CHRONOLOGICAL LISTING OF OLIN COMPLIANCE HISTORY

February 27, 1979	Olin Water Services submitted a Hazardous Waste Generator Report to KDHE stating that the facility utilizes reactive, corrosive, ignitable and toxic materials.
May 1, 1979	Olin submitted to KDHE an application for a hazardous waste storage permit.

April 17, 1980	KDHE conducted a hazardous waste generator's survey of the Olin's Water Services facility and found that the facility stores off-specification products on site for longer than 90 days. Periodically, these products are transported from the site for disposal.
November 18, 1980	EPA/RCRA received Olin Water Services Part A Hazardous Waste Permit Application, and signed statement that the operation or construction of the facility began before November 19, 1980.
December 16, 1980	EPA granted Olin an initial qualification for interim status as a hazardous waste management facility.
April 22, 1981	EPA RCRA conducted an inspection at Olin Water and cited the facility for four areas of non-compliance. These non-compliance issues included inspection requirements not being carried out, containerized ignitable or reactive wastes being stored too close to the property line of the plant, and no adequate aisle space between storage drums. In addition, Olin Water Services did not have a contingency plan.
June 8, 1981	Olin submitted to KDHE an application for a Kansas hazardous waste storage, treatment, and disposal facility permit.
September 11, 1981	KDHE issued a Letter of Warning to Olin Water Services requesting corrective action of the April 1981 non-compliance issues by November 1, 1981.
October 27, 1981	Olin responded to KDHE and provided corrective action to three of the four non-compliance items identified during the April 1981 EPA/RCRA inspection. Olin petitioned for modification of the requirement that containers holding ignitable or reactive waste must be located at least 50 feet from the property line of the plant.
July 26, 1982	KDHE and EPA renewed Olin's Interim Status Permit to June 30, 1983.
August 31, 1982	Olin submitted a variance request to KDHE/RCRA to petition for a variance to the regulation 40 CFR Section 265.176 that specifies that containers holding reactive

	or ignitable waste be stored 50 feet from the property line of the plant.
September 13, 1982	KDHE began the Part B Application process for Olin's hazardous waste storage facility. KDHE requested that this application be processed jointly by EPA and KDHE and that one permit issued to satisfy both state and federal requirements (EPA I.D. No. KSD000203638).
September 24, 1982	KDHE exempted the Olin Water Services from 40 CFR 265.176 until September 30, 1983 at which time KDHE planned to review the variance to determine if an extension was necessary.
December 21, 1982	KDHE conducted a RCRA inspection at Olin and found the facility to be in compliance with all state and federal regulations concerning generators and treatment, storage, and disposal facilities for hazardous waste.
January 6, 1983	EPA requested that Olin incorporate in the Part B Application a discussion of why the requirement of 40 CFR 265.176 could not be met and proposed alternatives to meet the intent of this regulation.
March 4, 1983	Olin submitted to EPA and KDHE 6 copies of the Part B Hazardous Waste Permit Application; copies were received on March 14.
May 5, 1983	EPA and KDHE reviewed the Olin Part B permit application, and had numerous regulatory comments, which Olin was required to respond to by June 24, 1983.
June 13, 1983	Olin requested an extension until July 18, 1983 to prepare its response to the joint EPA and KDHE comments regarding the Part B permit review on May 5, 1983.
June 21, 1983	KDHE and EPA renewed the facility's interim status until June 30, 1984.
June 23, 1983	EPA sent Olin a Letter of Warning approving the July 18, 1983, extension date and requiring the facility to mitigate the deficiencies in its Part B Permit Application by this date or face enforcement action.

July 18, 1983	Olin responded to EPA and KDHE May 5, 1983, Part B comments. Olin excluded some portions of the 40 CFR Part 264 facility standards because these standards were not directly applicable to the permit process regulations contained in 40 CFR Part 122 (now Part 270).
September 13, 1983	EPA and KDHE requested submittal of a complete Part B Permit Application.
November 23, 1983	Olin submitted a revised Part A Hazardous Waste Permit Application correcting all oversights from the original Part A.
March 7, 1984	KDHE completed the financial, technical, and management review of the Olin facility and recommends that the Part B Permit Application proceed according to schedule.
March 28, 1984	EPA issued to Olin a Complaint, Compliance Order, and Notice of Opportunity for Hearing pursuant to Section 3008 (a) (1).
March 29, 1984	EPA and KDHE reviewed Olin's July 18, 1983, response to the comment letter regarding completeness of Olin's Part B Permit. EPA and KDHE requested that the 40 CFR Part 264 information (outlining standards which define the management of hazardous waste) be received before the Part B Application was completed. Numerous other deficiencies were also addressed.
April 24, 1984	KDHE conducted a RCRA inspection at the Olin facility and found them to be in compliance except for the fact that the limited number of signs posted around the facility did not meet the regulatory safety requirements.
April 26, 1984	Olin responded to EPA/RCRA Part B Permit Application review comment letter dated March 29, 1984, and submitted numerous revisions to the Part B permit application including a revised Part A application.
May 3, 1984	Olin filed an Answer and Request for Hearing, Motion to Dismiss, Memorandum in Support of Motion to Dismiss, Motion for Prehearing Conference and Certification of Record.

May 31, 1984	EPA denied Olin's Motion to Dismiss (Docket No. 84-H-0015). EPA reviewed the Olin's April 26, 1984, response to comment on the RCRA Part B Permit Application and had numerous regulatory comments.
June 22, 1984	Olin responded to EPA Part B Permit Application review comment letter dated May 31, 1984.
July 11, 1984	EPA responded to Olin's June 22, 1984, comment letter and had a few remaining review comments.
August 7, 1984	Olin responded to EPA's July 11, 1984, review comment letter and made several revisions.
September 13, 1984	Olin submitted to EPA and KDHE 5 revised copies of the Part B Permit Application, concerning waste analysis plan, drum stacking, and buffer zone requirements.
September 14, 1984	Olin submitted to EPA and KDHE supplemental and revised information to correct and complete the Part B Permit Application.
September 20, 1984	Olin submitted to EPA and KDHE 5 copies of the corrected Part 270.14(b) (4) of the Part B Permit addressing the warning signs on the south and west sides of the hazardous waste storage facility.
September 21, 1984	EPA made a tentative decision to issue a RCRA permit to the Olin Water Services, Olin Corporation and issued a public comment period, which expired November 13, 1984.
NO DATE	EPA and KDHE issued joint Public Notice to the Olin Water Service facility for a Hazardous Waste Storage permit. If a decision was made to issue permits, the EPA permit would be issued under the authority of RCRA, while the KDHE permit would be issued under the authority of K.S.A. 65-3431 (i).
November 6, 1984	Olin waived the previous security procedures and equipment requirements in the draft Part B Permit; instead a three-sided structure with cinder block walls and a covered roof structure was constructed.

November 28, 1984	Olin submitted to KDHE the revised pages to Section 270.14(b) (4) of the Part B Permit omitting the requirement that the facility raise the height of the fence adjacent to the storage area to 16 feet.
January 4, 1985	The public comment period regarding Olin's Hazardous Waste Storage Permit ended.
January 23, 1985	EPA and the Olin Water Services developed a Consent Agreement and Consent Order for proceedings under Section 3008(a)(1).
March 6, 1985	KDHE decided that a final Part B Permit be issued to the Olin Water Service facility. The final permit would become effective on April 6, 1985, unless a review or hearing was requested.
March 15, 1985	Final Consent Agreement and Final Order agreed upon by Olin Corporation, Water Service Division and the EPA.
August 8, 1985	Olin completed construction of the hazardous waste storage containment facility. This facility is 38.5 feet from the production plant.
September 26, 1985	Olin submitted to KDHE a revised Contingency Plan.
April 29, 1986	KDHE notified Olin of the September 23, 1985, changes to the Kansas hazardous waste regulations specifying that a draft notice be placed on the property deed which details hazardous waste operations (K.A.R. 28-31-8).
July 29, 1986	KDHE conducted a RCRA inspection at the Olin facility and found several items not in compliance with state and federal regulations for generators of hazardous waste and permit requirements for storage of hazardous wastes. On the day of the inspection liquid from the VSR sump vat was being discharged onto the ground.
October 8, 1986	Olin advised KDHE that action has been taken to correct deficiencies noted during the July 29, 1986, RCRA inspection.
October 9, 1986	Olin submitted to KDHE revised pages of the Part B Permit Application. KDHE approved

	the modifications made on the revised pages and corrected the current Part B Permit.
October 24, 1986	KDHE conducted a follow-up RCRA inspection and found the facility to be in substantial compliance with State and Federal regulations concerning generators of hazardous waste. During the follow-up inspection, a float-activated pump was being installed on the volatile steam return (VSR) sump vat to prevent sump overflow.
April 20, 1987	KDHE and EPA conducted a joint RCRA Compliance Inspection of the Olin Water Service facility and the State Inspector determined that the facility was not meeting some of the requirements pursuant under the Kansas Hazardous Waste Management Law and/or the final permit.
May 22, 1987	Olin requested changes to their initial Part B Permit to include modifications concerning drum stacking height limitations.
June 15, 1987	Olin responded to the April 20, 1987, Compliance Inspection and corrected the deficiencies noted by KDHE.
July 2, 1987	KDHE requested that the accumulated methylene chloride waste generated by Olin's laboratory be labeled as F001 wastes and be moved to the permitted hazardous waste storage area and shipped off site within 90 days.
July 8, 1987	KDHE notified Olin of changes in RCRA regulations regarding closure, post-closure, and financial responsibility and requested modifications if appropriate.
August 7, 1987	Olin requested an extension of time for the storage of the F001 spent solvent wastes due to pending contract disposal negotiations.
August 12, 1987	KDHE approved Olin's request to extend until September 17, 1987, the 90-day period to store F001 waste.
September 25, 1987	Olin requested another extension to remove three drums of F001 wastes; difficulties were encountered in running analyses and selecting a transporter.

September 30, 1987	KDHE approved the additional extension until October 17, 1987.
October 23, 1987	KDHE reviewed Olin's Part B Permit modifications and tentatively approved the requested modifications to the hazardous waste drum storage stacking height to three high, but total storage capacity of only 200 55-gallon drums.
November 9, 1987	Olin notified KDHE that the F001 wastes had been removed from its facility to a permitted waste facility in Doe Run, Kentucky.
November 23, 1987	KDHE submitted to EPA Olin's proposed Part B Permit modifications for EPA's 15-day period of review and comment as specified in the EPA - Kansas Transition Plan.
December 17, 1987	KDHE provided Public Notice that the Olin facility may modify its hazardous waste storage permit to store drums by a linear height limitation and to conduct some inspections less frequently. The notice also announced that KDHE was solely authorized to modify the original Olin Permit.
December 18, 1987	KDHE tentatively decided to modify the RCRA permit issued to Olin Water Services and issued a 45-day public comment period.
December 28, 1987	KDHE amended Olin's generator status to include consideration of F001 generated wastes.
February 15, 1988	KDHE notified Olin that a final decision had been made to modify the Part B Permit to include the storage of drums with a linear height limitation and notice to conduct inspections less frequently.
April 20, 1988	KDHE conducted a RCRA compliance inspection and found that the Olin facility was not meeting some requirements pursuant to rules under the Kansas hazardous waste management law or specified in the final permit. Some of these non-compliance issues concerned unmarked containers, a pallet of assorted laboratory chemicals not included in the facility's storage permit, and unavailable generator's biannual report. During this inspection the use of a satellite

	accumulation area in the laboratory was discussed.
August 19, 1988	KDHE conducted a follow-up RCRA inspection and found the facility to be in substantial compliance with state and federal hazardous waste regulations.
March 1, 1989	KDHE conducted a RCRA compliance inspection and found no violations of the Kansas hazardous waste management statutes and/or regulations.
December 20, 1989	KDHE conducted a RCRA compliance inspection and found the facility not to be in compliance with state and federal regulations concerning inspection schedules and personnel training.
December 1989	Olin Water Services-Olin Corporation was sold to Drew Industrial Division (Ashland Chemical Company).
December 27, 1989	Part B Permit (KSD000203638) transferred from the Olin Corporation to Drew Industrial Division (Ashland Chemical, Company). The transaction was closed on December 29, 1989.
January 10, 1990	KDHE notified the Olin Water Services of the State's updated hazardous waste regulations. These include all regulations in 40 CFR 264, 265, 270, and 124 Subparts A, B, E, and F as in effect on July 1, 1989. K.A.R. 28-31-8 and 28-31-9 specifically adopt regulations applicable to the Olin TSD management operations.
January 22, 1990	Olin Water Services notified KDHE that the facility had corrected the two non-compliance issues identified during the December 20, 1989, compliance inspection.
March 18, 1990	Olin submitted a revised Notification of Hazardous Waste Activity form reflecting the change of ownership to Drew Industrial Division.

SECTION 4: ENVIRONMENTAL SETTING

4.1 CULTURAL AND ENVIRONMENTAL SETTING

Olin Water Services is located in the Fairfax Industrial District of Kansas City, Wyandotte County, Kansas. This industrial area is located in a densely populated area of the city. The nearest residential area is Kansas City, Kansas (population 162,070), which lies between 1/2 and 1 mile south-southwest of the site. Population concentrations within four miles of the site would encompass areas of Kansas City, and Riverside, Kansas, and Kansas City and North Kansas City, Missouri (USGS 1964; USGS 1975). The nearest residential area lies 1/2 or more miles south-southwest. A city park is located about 1/2 mile directly south of the Olin facility, and Dunbar School is located approximately 3/4 miles southwest.

4.2 TOPOGRAPHY AND DRAINAGE

The Olin Water Services facility is in the southeast corner of Wyandotte County, which lies in the Osage Cuestas physiographic unit. The main topographic features of the county are the deeply dissected loess bluffs with rock outcrops rising about 105 feet above the site to the south-southwest, and the floodplain of the Missouri River (USDA 1977). The Missouri River is located about 3,200 feet north of the site. It flows west to east at an average flow rate of 54,780 cubic feet/second (cfs) and drains the northern and eastern parts of Wyandotte County within a four-mile radius of the site (USGS 1964; USGS 1975; USGS 1980).

The site topography has a maximum slope of one percent, which is typical of alluvial flood plains. Surface water drainage from the Olin site is probably toward the north-northeast where ultimately it is collected in a storm sewer along the northern property line (E & E 1990). The actual entry point into the Missouri River is unknown.

A surface water intake at the Kansas City, Missouri, Water Works facility is located northeast of the site (upgradient) on the north bank of the Missouri River about 2.5 miles above the Missouri-Kansas

confluence. In addition, two well fields composed of seven wells are located adjacent and north of the surface water intake. The Kansas City, Kansas, surface water intake which serves 80 percent of Wyandotte County is located upriver about 2 miles from the site (Hasan 1988).

The Olin facility, as well as the entire Fairfax Industrial District, is within the Fairfax-Jersey Creek Levy Unit as designated by the U.S. Army Corps of Engineers (Hasan 1988). This area is identified as being protected from a 500-year flood (Olin 1983).

The only known potential wildlife habitat is Goose Island, located directly east on the south bank of the Missouri River. To date, it is unknown if this habitat is utilized by any state or federally designated threatened or endangered species.

4.3 SOILS

The soils at the Olin Water Services site are of the Onawa Series (USDA 1977). Onawa soils are nearly level, calcareous, and somewhat poorly drained on flat to slightly depressional floodplains. They are mainly on bottomland along the Missouri River and are subject to occasional flooding. In the area of the Olin facility, the surface layer (approximately 6 to 20 inches in thickness) are of the Onawa (overwash) soil series. These soils consist of fine sandy loam to silt loam and developed from alluvium deposits from a rare major flood. The next layer is dark-gray and very dark-gray silty clay about 19 inches thick. It is underlain by grayish-brown coarse silt loam. Onawa soils are deep and permeability is low.

4.4 STRATIGRAPHY

The Olin Water Services site is underlain by Quaternary-age Missouri River alluvium consisting of sand, silt, and gravel deposits. The alluvial deposits range in thickness from 0 feet on the river bluffs, to more than 100 feet in the floodplain area (KGS 1963). Generally, the thickness of the alluvial deposit is directly related to the width of the floodplain. In the site vicinity the alluvial deposits are about 125 feet deep (Layne 1979). The upper 50 feet consists of finer sands and silt, which grade into coarser sands and gravel with increasing cobbles and boulders at about 100 feet (Layne 1979).

The Pennsylvanian-age bedrock outcropping in river bluffs within a four-mile radius of the site comprises the Kansas City Group and upper members of the Pleasanton Group (KGS 1963). In the site vicinity, the Kansas City Group is removed, leaving the upper members of the Pleasanton Group to directly underlie the Missouri River alluvium (KGS 1963). The Pleasanton Group consists of cyclothemic limestones and shales and occasionally sandstone. The group ranges in thickness from 20 to 150 feet. The Pleasanton Group is considered to be the basal aquitard for the limestones of the Kansas City Group (KGS 1963).

The Pennsylvanian rocks dip gently westward (KGS 1963). A generalized stratigraphic column illustrating geology in the site vicinity is included as Figure 4-1.

4.5 GROUND WATER

The aquifer of concern is located within the sands and gravels of the Missouri River alluvium. Depth to ground water in the Missouri River valley is generally between 15 and 30 feet depending on location and season. The levels fluctuate as influenced by river stage and the recharge from the surrounding uplands (Hasan 1988). The static water level near the Olin facility is about 21 feet (Layne 1979). The regional ground water flow is to the north and east, toward the Missouri River.

The Missouri alluvium is considered a high-capacity aquifer and provides wide spread industrial, agricultural (self-supplied), and municipal supplies. A large ground water sink in the Kansas City area is also found in alluvial valleys of the Kansas River. The Kansas City, Missouri, and Kansas City, Kansas, municipal water is derived almost exclusively by alluvial wells and surface water intakes along the Kansas and Missouri rivers (Hasan 1988). The nearest well field to the Olin Water Services site is located on the Missouri River, approximately 1.5 miles northeast of the Olin site (USGS 1964).

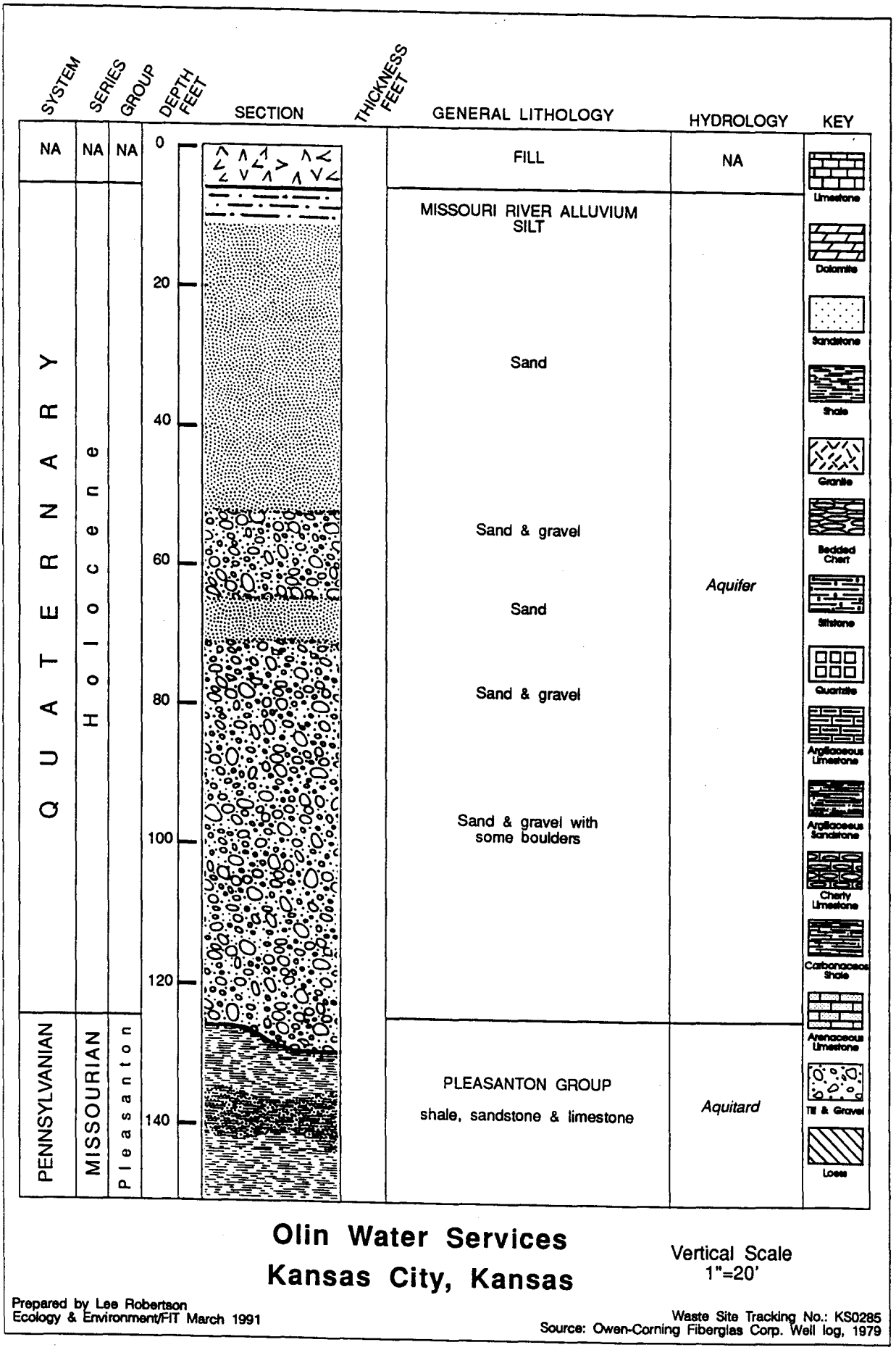


Figure 4-1: GENERALIZED STRATIGRAPHIC COLUMN

SECTION 5: DESCRIPTION OF INDIVIDUAL SOLID WASTE MANAGEMENT UNITS

5.1 HAZARDOUS WASTE CONTAINER STORAGE AREA

5.1.1 Information Summary

Unit Description

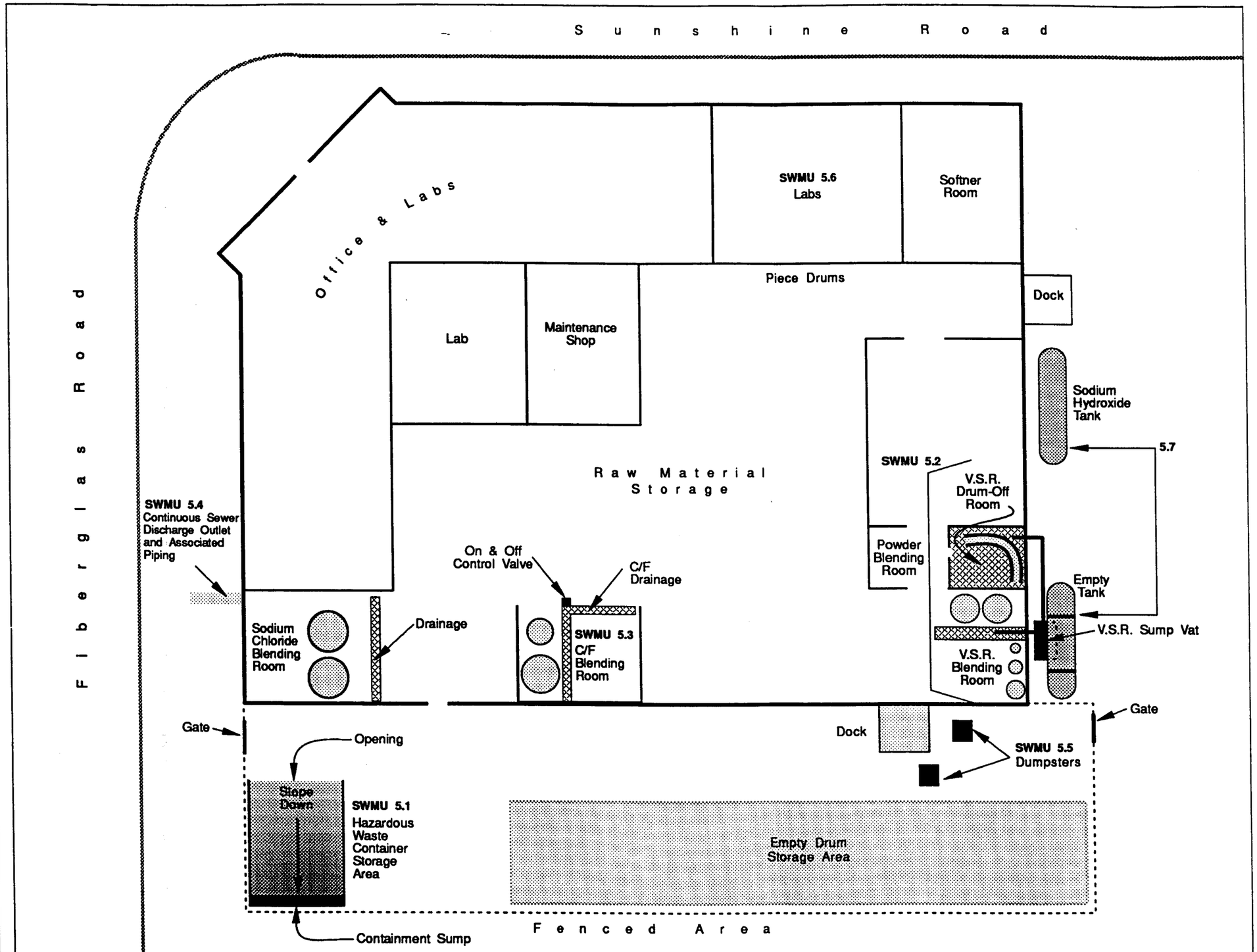
The hazardous waste container storage area (Appendix A; Photos 4 to 7) is a detached building located in the southwest corner of the production yard of the Olin Water Services facility (Figure 5-1). The overall dimension is about 31 by 26 feet, and the area available for storage is about 25 by 24 feet (Olin 1983). The floor of the building is a reinforced concrete slab surrounded on three sides by concrete block walls and covered by a steel roof with clear panels for lighting. The north side of the building is open and has a six-foot-wide ramp along the entire length. A concrete sump is located along the south wall of the container storage area and provides secondary containment. The drums are stored on 4-foot-wide pallets in 4 rows, 5 pallets deep with aisles on either side of the rows and stacked at a height not to exceed 12 feet. The total number of drums stored in the container area will not exceed 200 55-gallon drums (Olin 1987). Some of the drummed wastes have been stored in this facility for several years (E & E 1990). Warning signs are posted around the storage facility so as to be clearly legible at any position within 25 feet of the container storage area. Additional security is provided by a private security patrol which makes nightly patrols. The hazardous waste container storage area is a RCRA-regulated unit and is about 38.5 feet away from the production plant (Olin 1987).

Dates of Operation

1985 to present

Wastes Managed

The hazardous waste container area is used to store liquids and solids (powder), with the majority being aqueous wastes that are off-specification raw materials and products (Dame 1990). Character-



Olin Water Services
Kansas City, Kansas

Plant Building

N

LEGEND

SWMU 5.1	Hazardous Waste Container Storage Area
SWMU 5.2	V.S.R. Sump Vat and Drainage
SWMU 5.3	C/F Blending Room Drainage
SWMU 5.4	Continuous Sewer Discharge Outlet and Associated Piping
SWMU 5.5	Dumpsters
SWMU 5.6	Satellite Accumulation Area
5.7	Area of Concern
C/F	Corrosive & Flammable
V.S.R.	Volatile Steam Return
	Collection Trench
	Above Ground Product Storage Tank
	Product Blending Tank/ Storage Tank

0 Scale in Feet 50

Prepared by Lee Robertson
Ecology & Environment/FIT March 1991

Waste Site Tracking #: KS0285
Source: Olin Water Services, 1984

Figure 5-1: SWMU LOCATIONS

istic hazardous wastes (ignitable, corrosive, reactive, and/or toxic) are the major type of wastes stored in the facility with the exception of four drums of U-listed wastes and several drums of non-hazardous waste (polymers) (E & E 1990). All wastes stored in the facility are generated by Olin Water Services. On occasion, a customer may return an off-specification product to be reworked. The actual composition of the drummed characteristic wastes is unknown. In addition, the quantity of wastes varies, but the facility inventory records obtained during the April 1990 VSI showed that 138 drums are stored in the container storage area (Appendix D). The last entry noted in the facility inventory list was on November 4, 1989. The majority of waste listed consisted of D001 ignitable waste (93 drums) and D007 EP toxic wastes (33 drums). The inventory also listed eight drums of D002 corrosive materials; three drums of orthodichlorobenzene; and one drum of pentachlorophenate. Bill Dame, Olin Plant Manager, has reported that 13 drums of off-specification product (Olin #2806) have been removed since the April 1990 VSI. Therefore, 125 hazardous waste containers were being stored in this RCRA-regulated unit at this writing. This waste has been stored in this SWMU greater than 90 days.

Release Controls

The storage facility is designed to physically and structurally hold an area four pallets wide by five pallets deep. The floor is constructed of a monolithically poured concrete base and slopes to the south toward a containment sump constructed of concrete reinforced with carbon steel wire mesh (Figure 5-1). The sump cover is made of a carbon steel grate. The sump capacity is sufficient to provide for collection of 10 percent of the storage facility's free liquid capacity (Olin 1987). Run-on is prevented by the cinder block walls on the south, east, and west sides of the facility and an access ramp on the north side of the storage area. Under the terms of the Part B Permit, drums of aqueous waste material should be placed between ignitable and reactive solid materials and ignitable liquids to form a buffer zone (Olin 1987). During the VSI, it was unclear whether an adequate buffer zone was in place for this unit; however, the actual potential of a fire and/or violent reaction is inherently low due to the characteristics of

the chemicals utilized at the Olin facility.

The hazardous waste container storage area is inspected by Olin personnel for adequate aisle space, container deterioration, and condition of containment floor and sump. If liquid accumulates in the storage area it is pumped with a portable sump pump into 55- or 30-gallon container(s). The wastes are sampled and analyzed as outlined in the EPA/KDHE Part B Waste Analysis Plan (Olin 1983). If the liquid is found to meet all the sanitary sewer discharge requirements as addressed in Olin Water Services Wastewater Discharge Permit (#I880) (Appendix E) it will be discharged to the sanitary sewer via one of the trench drains inside the plant. However, if the accumulated wastes are determined to exhibit hazardous wastes characteristics, it will be placed in the hazardous waste container storage area (E & E 1990).

History of Releases

Available file information provided no documentation or indication of releases from this unit. Observations made during the VSI provided no indications of any releases from this unit. Drummed wastes were neatly stacked and did not exceed the 12-foot linear height requirement addressed in Olin's Part B Permit (Olin 1987; E & E 1990). Overall, the containers and the concrete floor of the hazardous container storage area were in adequate condition; however, a few drums were slightly dented, and an empty drum was blocking the aisle at the sump located in the back of the storage facility. The containment sump was not thoroughly inspected during the VSI, so the integrity of this containment feature is unknown.

5.1.2 Further Information Needs

The Olin/Drew purchase agreement called for all waste in the hazardous wastes container storage area to be disposed off site. Olin planned to have this completed by November 30, 1990 (Dame 1990). Further information is needed to verify whether removal of the hazardous waste from the container storage area has been accomplished. Furthermore, proper closure proceedings will need to be addressed by the new facility owners (Drew Industrial Division).

5.2 VSR SUMP VAT AND DRAINAGE

5.2.1 Information Summary

Unit Description

The volatile steam return (VSR) formulating area includes two rooms consisting of a blending area with five tanks and related equipment and an area referred to as the Drum-off Room (Figure 5-1). It should be noted that the name given to this blending area refers to the production of volatile amines which were produced in this area 20 years ago. This application, that the name implies, no longer exists for this formulation area. One of the blending tanks in the VSR Room was a Fuel Oil Treatment (FOT) tank, with a capacity of 1,000 gallons. An Olin representative reported that this tank had been out of service about a year due to the elimination of fuel treatment products. Since the VSI, this tank has been removed from the VSR Blending Room (Prouty 1990). The VSR tank, (capacity 2,000 gallons) is still used and is made of stainless steel (Appendix A, Photo 12). Three smaller stainless steel blending tanks with capacities of 100, 300, and 750 gallons are also utilized in the VSR Room and are located along the east wall. All tanks are situated on a monolithically poured concrete base. The VSR Drum-off Room is a packaging room for finished products; chemicals from the VSR blending tanks are pumped and containerized into drums.

The waste from the two rooms is collected in a self-contained sump vat located outside between the production plant and the empty product storage tank. The above-ground steel vat is about 2 feet by 6 feet and has a maximum capacity of 100 gallons (Appendix A, Photo 14). The VSR blending room has a one foot wide by two foot deep concrete in-floor trench with a covered metal grate (Appendix A, Photo 12). This floor trench is continuous with the containerized sump vat (Appendix A; Photo 14; Figure 5-1). The maximum capacity of the trench is also 100 gallons. The collection trench in the VSR Drum-off Room comprises the entire floor with an outlet located in the northeast corner with PVC piping extending outside to the containerized steel sump vat (Appendix A, Photos 13 and 15; Figure 5-1). When appropriate, a float-activated pump is installed on the VSR sump vat to prevent trench and sump overflow. When the pump is activated, waste from the VSR sump vat is

pumped into nearby 55-gallon drums. About four drums (200 gallons) of aqueous waste would accumulate on an average of 6 to 7 working days. After this period, the drums would be replaced. The VSR sump vat and drainage units do not require a RCRA permit.

Dates of Operation

Specific start date is unknown; however, it is known to be after 1970. The unit is active.

Waste Managed

Various raw materials (Appendix C) are utilized in the VSR formulating area and exhibit hazardous characteristics (reactive-corrosive-ignitable-toxic). The type of characteristic waste generated in this blending area varies depending on the compound produced. At one time, a large percentage of chromium product was produced in this blending area generating D007 characteristic waste (EP toxic for chromium). However, through the Olin/Drew purchase agreement, Olin Water Services in Kansas City has eliminated the production of chromium products. Currently, the majority of wastes generated in this formulating area include characteristic corrosive waste (D002). A minimal amount of characteristic reactive waste (D003) are also generated (Prouty 1990).

Any aqueous wastes generated in this blending area is from spillage from drum loading operations or non-reusable rinse water from the blending process. Wastes are collected in the trench and sump vat system and retained there until full capacity is reached (Prouty 1990). Full capacity is about 200 gallons and when the float activated pump and nearby 55-gallon drums for overflow are not in place, the accumulated wastes in the sump vat and trench would be pumped out about every 2 days (Dame 1991). The wastewater is tested about once or twice a week and the majority is either recycled as make-up water for succeeding batches or discharged down the sewer collection system after neutralization (Bosky 1987; Prouty 1990). All generated waste material is neutralized to meet the pretreatment agreements for Publicly Owned Treatment Works (POTW) discharge parameters outlined in Olin's wastewater discharge permit (#I880) (Appendix E). If analysis indicated that the liquid

exhibits hazardous waste characteristics or that the liquid does not meet the sewer discharge parameters, the waste will be placed into a suitable container and stored in the container storage area. As of January 17, 1985, there are two drums of VSR drum waste (D007) stored in the RCRA-regulated container storage area (Appendix D).

Release Controls

Any liquid spillage from the VSR formulating area is either washed down into the trenching and sump vat system or collected with an industrial absorbent and containerized (Bosky 1987). The wastewater collection trench and sump vat units are isolated from the main plant sewer discharge system and act as release control features for the VSR formulating area.

The integrity of the collection trenches are unknown. The sump vat itself is not surrounded by any secondary containment structure; however, it is mounted on a concrete pad base. These units are inspected by Olin on a regular basis.

History of Releases

A KDHE compliance inspection conducted on July 29, 1986, indicated a liquid discharge from the VSR sump vat onto the ground (Smith 1986). The exact amount of liquid discharge was not reported in the KDHE Compliance Inspection; however, a Drew representative reported that the seepage from the sump vat during the 1986 State inspection was the result of previous sump vat overflows of small unmeasurable quantities (merely wetting the sides of the sump vat). A sample obtained from this liquid revealed chromium contamination. After this incident, the facility installed a float activated pump on the VSR sump vat to prevent sump overflow (Fischer 1986). When the pump is activated, wastes from the VSR sump vat would be pumped into nearby 55-gallon drums and placed outside on a wooden pallet. The liquid level was checked daily to assure that the drum would not overflow. The drummed waste would be sampled and analyzed under the same analytical criteria as the sump vat wastes.

During the April 1990 FIT VSI, the float-activated pump and nearby 55-gallon drums for overflow were not in place for the VSR formulating

area. However, when chromium products were being manufactured, the VSR overflow system was operational (Dame 1990). Chromium residual that adhered to the VSR floor and drainage system was flushed and cleaned with water and the rinsate was accumulated in 2 to 4 55-gallon drums.

Since the July 1986 RCRA inspection, there has been no other documentation or indications of releases from this SWMU system. Presently, the VSR overflow system is no longer used by Olin Water Services because chromium products are no longer produced. The VSR sump vat and collection trench is monitored (visual inspection) from the inside of the VSR Blending Room (Dame 1990). Olin/Drew representatives are considering removing the VSR sump vat unit and incorporating an automatic on/off valve attachment to the present collection trench system; therefore, drainage could then be released to the plant's sewer discharge outlet. During the writing of the final draft of this report, Olin Water Services reported to FIT that the self-contained drainage system that was once emplaced in the VSR Blending Room had been eliminated; drainage from this formulating area is now connected to the plant's sewer system with an appropriate automatic on/off valve attachment to regulate whether it is continuous with the plant's sewer discharge system (Dame 1991).

Observations made during the April 1990 VSI provided no indications of releases from the VSR sump vat and drainage system. However, the paint on the steel containerized sump vat was corroded (Appendix A; Photo 14). A small amount of pasty liquid was noted on the floor in the VSR Blending Room. The blending product tanks were in adequate condition.

5.2.2 Further Information Needs

None required at this time.

5.3 C/F BLENDING ROOM DRAINAGE

5.3.1 Information Summary

Unit Description

The Corrosive or Flammable (C/F) Blending Room consists of a 2,000-gallon blending tank and utility storage tank. The utility

storage tank has a capacity of 2,000 gallons and stores raw material for use in the blending process. Both tanks are situated on a monolithically poured concrete base. Finished compounds are packaged in the C/F Blending Room by Olin personnel. Like the VSR Room, the name given to the C/F Blending Room was dedicated 20 years ago. Currently, the area is not restricted to only formulating corrosive or flammable products.

The aqueous waste from this formulation area is collected in an in-floor concrete trench topped with a metal grate (Appendix A; Photo 16). This concrete floor drainage trench measures one foot by two feet and is located in front of the two tanks, running north to south; and along the entrance running east/west (Figure 5-1). The maximum capacity of the C/F drainage system is 100 gallons. An on/off valve located in the center of the C/F drainage system regulates whether it is continuous with the plant's sewer discharge system (Appendix A; Photo 17; Figure 5-1). The C/F Blending Room drainage does not require a RCRA permit.

Dates of Operation

The specific start date is unknown; however, it is known to be after 1970. The unit is active.

Wastes Managed

The C/F Blending Room is used interchangeably with the VSR Formulation Area. Similarly to the VSR Room, a variety of materials (Appendix C) exhibiting hazardous characteristics are used to produce the finished water treatment compounds. The type, analysis, and management of wastes generated in this blending room are also similar to the current operations of VSR Formulating Area (See Section 5.2). It is unknown whether any wastes generated in the C/F Blending Room during the aqueous batching process is recycled as make-up water for succeeding batches. The C/F Blending Room is also utilized as a drum-off area (packaging area) for polymers (non-hazardous material). After the packaging process is completed, the generated wastes would be drummed because of its high chemical oxygen demand (COD) characteristic. The last time this type of material was placed in the hazardous container storage area was 1989 (Dame 1991). During the batching process, the majority of generated wastes after analysis by Olin personnel is

discharged directly into the municipal sanitary sewer system (E & E 1990).

Release Controls

If spillage occurs in the C/F Blending Room, it is washed into the 100 gallon collection trench (aqueous materials). Similarly to the VSR room, the trench is embedded into the concrete floor and acts as a containment feature for the C/F Blending Room. The integrity of the trench is unknown. Unlike the VSR room, the collection trench in the C/F Blending Room discharges to the plant's sanitary sewer line. However, a control valve can isolate the C/F Blending Room drainage from flowing continuously with the main sewer line. The trench is emptied only after it reaches full capacity and appropriate analysis has been conducted by Olin personnel. This unit is checked by Olin on a regular basis.

History of Release

Available file information provided no documentation or indication of releases from this unit. Observations made during the VSI provided no indications of releases from this unit. The blending product tanks also appeared to be in good condition.

5.3.2 Further Information Needs

None required at this time.

5.4 CONTINUOUS SEWER DISCHARGE OUTLET AND ASSOCIATED PIPING

5.4.1 Information Summary

Unit Description

The plant discharge drain is a 12-inch piping system which extends throughout the plant building (E & E 1990). The overall layout of the plant's drainage system is unknown; however, the discharge outlet to the POTW is located on the southwest side of the plant building (Figure 5-1). The Sodium Chloride Blending Room collection trench as well as all other trenches and drains in the plant building, except for the C/F and VSR Blending Rooms, are open continuously to the municipal sewer system (Prouty 1990). The Soduim Chloride Blending Room/Area has two

reinforced plastic storage tanks, each having a 2,000 gallon capacity. Wastes are collected in a collection trench topped with a metal grate running north-south in front of the two blending tanks (Figure 5-1). The Olin Water Services open drainage system falls under the auspices of a POTW Wastewater Discharge Permit (#1880); the issue date is November 14, 1989; the expiration date is November 14, 1994 (Appendix E). The plant's drainage flows into a sanitary/industrial sewer line which runs south from the Olin property to the Fairfax Pump Station located at 1520 W. 2nd Street (Gill 1990). The plant's sewer system does not require a RCRA permit.

Dates of Operation

The specific startup date is unknown. The unit is active.

Wastes Managed

Any spillage or washdown water from the sodium chloride batching process or any other area in the plant building (except for the C/F and VSR Blending Rooms) are routed to the plant's discharge outlet. Olin representatives have verified that the generated wastes from the sodium chloride blending process is minimal and meets all POTW discharge parameters (Dame 1990; Prouty 1990). Therefore, neutralization does not occur before discharging to the municipal sewer system.

A separate blending room called the Powder Blending Room is located west of the VSR Drum-off Room (Figure 5-1). This room is not utilized very much and is where Olin formulates flammable solids (D001) such as sodium sulfite and sodium hydrosulfite (Dame 1990). It is unknown if this blending area maintains a collection trench/drain for spillage or washdown water and discharges to the plant's discharge system. It is thought that dry spillage from drum loading is swept up and placed into a product drum (Bosky 1987).

The Olin Wastewater Discharge Permit has indicated that the permittee will not discharge any wastewater having a pH lower than 5.5 or higher than 9.5 or containing any other prohibited substance or material in accordance with the Code of City Ordinances, Chapter 30, Articles I - VII (Appendix E). Sampling does occur at two periods throughout the year; samples are collected during normal working hours

at the plant's discharge outlet before wastewater enters the municipal sanitary sewer system.

The facility's average daily discharge flow for the entire plant is about 450 gallons with the maximum being 600 gallons (Gill 1990).

Release Controls

Similar to the other wastewater collection trenches/drains within the manufacturing plant, the sodium chloride collection trench is embedded into the concrete floor. The trench executes as a release control for this area in the plant building. The integrity of this collection system and the overall plant drainage is unknown. This SWMU is inspected regularly by Olin personnel.

History of Releases

Available file information provided no indication of any spills from this unit. In addition, the floor in the Sodium Chloride Blending Room was clean and the blending tanks appeared in good condition. Throughout the plant building, good housekeeping practices were observed. It has been reported that the Olin Water Services has not been deficient on its wastewater permit requirement for the past two years. In addition, Olin has probably never exceeded the limitations outlined in the POTW permit (Gill 1990). Samples collected by Olin personnel in January 1990 at the POTW discharge outlet indicate that the facility is within discharge limitations (Appendix F).

5.4.2 Further Information Needs

A map illustrating the overall layout of the plant building's drainage system would be helpful to completely assess this SWMU.

5.5 DUMPSTERS

5.5.1 Information Summary

Unit Description

There are two dumpsters located in the production yard. These two solid waste disposal units are adjacent to the loading dock area southeast of the plant building (Figure 5-1). Both nonhazardous waste

receptacles are made of steel. The dimensions of both are about 6 feet high by 10 feet wide by 5 feet deep. The hauling company is Shostak Iron and Metal Company, telephone 321-9210. These units are SWMUs and do not require a RCRA permit.

Dates of Operation

The specific start date is unknown. The unit is active.

Waste Managed

The dumpster located east of the south loading dock contains solid wastes such as scrap building materials and empty unusable drums, which have been triple rinsed and crushed (Appendix A; Photos 10 and 11). The dumpster located in the southeast corner of the same loading dock usually contains sanitary trash, plastic, and some crushed, triple-rinsed drums (Prouty 1990). The drums are recycled until they are no longer usable. The drum rinsing process takes place directly in the formulating batch tanks in the VSR and C/F Blending rooms only. A manlift reaches to the top of the tank where an Olin employee rinses and cleans the drum (Prouty 1990). The non-hazardous solid waste contained in these dumpsters are periodically disposed at the Johnson County Landfill. The amount of waste generated varies; it is usually less than two tons a year (E & E 1990).

Release Controls

These SWMUs are made of steel and rest on a monolithically poured concrete slab. These units are inspected regularly by the Olin personnel.

History of Releases

File information provided no documentation of releases from the units. Observations made during the VSI indicated no releases from these units.

5.5.2 Further Information Needs

None required at this time.

5.6 SATELLITE ACCUMULATION AREA

5.6.1 Information Summary

The Olin Water Services operates an on-site laboratory in the plant building (Figure 5-1). This lab is not utilized to a great extent and has become strictly a Quality Control (QC) lab (Dame 1990). Presently, the lab is used to conduct disposal analysis (testing waste generated by Olin), water analysis for customers, and some biochemical analysis. Small amounts of "F-listed" chlorinated solvents (methylene chloride) are being used in the Olin laboratory to clean lab ware. The resulting waste is accumulated in five-gallon safety cans and stored temporarily under the lab sink; this has been designated a satellite accumulation area. When the container is full, it is transferred to a 30-gallon drum which is also stored in the laboratory (Dame 1990). When the 30-gallon drum reaches capacity, which takes several years, it is stored in the permitted hazardous container storage area until shipment. These temporary waste containers are SWMUs, and do not require a RCRA permit. The FIT was unable to determine the start-up date of this SWMU, but the unit is currently active. This unit has no release controls. No releases or housekeeping problems were observed during the VSI.

5.6.2 Further Information Needs

None required at this time.

5.7 AREA OF CONCERN

5.7.1 Information Summary

There are two above-ground product storage tanks located on the east side of the production plant (Figure 5-1). The south tank is internally divided into three 2,000-gallon compartments (Appendix A; Photo 9; Appendix G). This tank once contained flammable material and has been empty since the Drew/Olin purchase agreement in December 1989, and January 1990. When utilized, the southern compartment of the 6,000 gallon tank contained morpholine and the center and northern compartments stored cyclohexlyamine since 1985. Historically, the center tank has been used for several different materials. Initially, kerosene was stored in the center section; and in the 1970s, the compartment was used for storage of aromatic naphtha (Appendix G). The

north tank (capacity 10,000 gallons) currently contains sodium hydroxide (Appendix A; Photo 8). Prior to the April 1990 VSI, Jim Fischer of KDHE reported to FIT that during his most recent compliance inspection he found soil discoloration near the north product storage tank (sodium hydroxide tank). However, during the April 1990 VSI, no evidence of a spill or pooling liquid was observed. It should be noted that the stained area may have been washed away by precipitation. The FIT was unable to determine the start-up dates of these two tanks. Currently, there are no secondary containment features surrounding the tanks. Future plans are to remove the two product storage tanks and replace them with a tank farm, consisting of about 16 5,600-gallon to 9,600-gallon storage tanks (E & E/FIT 1990).

An environmental audit was conducted by Drew/Ashland representatives, as outlined in the December Drew/Olin purchase agreement (Appendix G). The environmental audit was conducted by a subcontractor in November 1989 for purposes of decision making regarding the purchase of Olin property. The audit consisted of the installation of three monitoring wells on the Olin Water Services site and the collection of twelve soil borings (depths ranging in 1.5 to 9.0 feet) with nine being submitted to the laboratory for analysis. Analysis for ground water and soil samples consisted of volatile organic compounds (VOCs), semi-volatile organic compounds, pesticides, and total metals for soil samples, and dissolved metals for water samples. For a complete copy of laboratory results and sample locations see Appendix G.

Analytical water sample analysis indicated trichloroethylene (TCE) in all three monitoring wells at concentrations ranging from 5.9 and 34 µg/L and 1,2-dichlorethylene (1,2-DCE) in monitoring well #2 at a concentration of 23 µg/L. Monitoring well #1 had the highest TCE concentration and is located east of the plant building between the two aboveground storage product tanks (Appendix G; Figure 1).

The soil boring analyses indicated soil contamination around the aboveground storage tanks and in the lot south of the plant building. The analysis indicated the majority of the soil contamination at a depth down to 4 feet and near the southernmost aboveground storage tank (Appendix G; Tables 1 to 3). Common fuel constituents such as benzene,

toluene, xylene, and ethylbenzene were detected in soils near the south tanks at concentrations ranging from 5.7 µg/kg to 2,700 µg/kg. In addition, dichlorobenzene was found in two of the soil borings with the highest concentration at 9,300 µg/kg. Soil investigations also indicated TCE at a concentration of 58 µg/kg in the south lot of the plant building near the empty drum storage area. Several polycyclic aromatic hydrocarbons (PAHs) were also detected at one soil boring location (SB-10) near the south tank (Appendix G; Figure 1). This sample was collected at a 1.5 to 3.5 foot interval and PAH concentrations ranged from 930 µg/kg to 2,200 µg/kg. Pentachlorophenol (PCP), a wood preservative was detected at 22,000 µg/kg at the same interval and location.

1,1,2,2-tetrachloroethane was also found at deeper depths (7 and 9 feet) at SB-10 as well as in a number of shallower borings around both aboveground tanks (concentrations ranged from 11 µg/kg to 500 µg/kg). Morpholine and cyclohexnone were also detected at low concentrations (ranging form 220 µg/kg to 990 µg/kg) in several shallow soil borings around the south tank (Appendix G; Table 2). These two compounds were once stored in the southernmost aboveground tank. The most significant metal concentration was chromium at 260 µg/kg collected at a 1.5 to 3.5 foot soil interval near the south tank. This concentration is almost 10 times greater than all other chromium concentrations detected in the eastern section of the plant building (Appendix G; Table 3).

5.7.2 Further Information Needs

The Drew Pre-Acquisition Investigation (PAI) report has indicated that soil and ground water contamination has occured on the property of the Olin Water Services facility. Drew representatives have indicated that a follow-up investigation has also been conducted. This report should also be reveiwed to further characterize the potential problems of the Olin facility.

SECTION 6: SUMMARY OF SITE VISIT

The VSI of Olin Water Services was conducted on April 27, 1990. The VSI began at 0900 hours and was completed by 1230 hours. The inspection was conducted by FIT personnel Patty Roberts and Otavio Silva, EPA/RCRA representative Mark Matthews, and KDHE/RCRA representative Paul Cahoon. The Olin Water Services representatives were William Dame and Larry Prouty. William Olasin from the Ashland Chemical Company was also present. The VSI began with an inspection of the warehouse, which serves as a shipping and receiving area. This warehouse also houses some administrative offices. No SWMUs were identified in this building.

After inspecting the inside of the warehouse, the FIT inspected the east perimeter of the plant building where two aboveground product storage tanks are located. Next, FIT inspected the interior of the plant facility, which houses all the chemical formulating areas as well as the Olin laboratory. The RCRA-regulated hazardous container storage area located in the production yard was also inspected. After the reconnaissance of the plant facility and its perimeter, six SWMUs and one area of concern as detailed in Section 5 were identified. Photo documentation was conducted during the VSI and is included as Appendix A. No indication of any releases were observed by the FIT during the VSI.

SECTION 7: SUMMARY AND CONCLUSIONS

The E & E/FIT was tasked under the U.S. EPA's EPI program to conduct a background review and VSI of the Olin Water Services-Olin Corporation site located in Kansas City, Kansas. The VSI was conducted on April 27, 1990, in coordination with RCRA and company officials. The scope of the EPI/PA was to identify, characterize, and determine releases from SWMUs at the facility.

Olin Water Services has been in operation since 1970 and manufactures chemicals for industrial water treatment facilities. Processes include batch blending of approximately 150 different raw materials, to formulate approximately 250 water treatment compounds. The waste generated during this blending process can vary and exhibits hazardous characteristics, such as ignitability, corrosivity, reactivity, and/or toxicity. Wastes generated during the blending process consist of spillage from loading operations or rinsewater; most of this waste is recycled or discharged down the sanitary sewer system after analysis designates that it is within the parameters outlined under the POTW permit (#I880). The majority of wastes that are accumulated is from raw material and finished products that are unuseable as off-specification. These various wastes as well as any other designated hazardous waste are stored in the RCRA-regulated hazardous container storage area. Olin operates as a storage facility under a Part B Permit notification. In addition to being a storage facility, the Olin site has been classified as a Kansas generator; that is, the facility generates between 25 and 1,000 kilograms of hazardous wastes per month.

The FIT identified six SWMUs during the VSI at the facility. The SWMUs were identified and a brief description of each is as follows.

Hazardous Waste Container Storage Area

This SWMU is a 3-sided cinder block building located in the production yard. The maximum number of drums stored in this facility is not to exceed 200 55-gallon drums. Both hazardous and non-hazardous (liquid and solids) wastes are stored in this storage area for a

long-term basis. Future plans are to dispose of all hazardous wastes in the container storage area.

VSR Sump Vat and Drainage

This SWMU consists of an outside sump vat and in-floor trenches from the VSR Blending and Drum-off rooms. When appropriate an activated pump is installed on the VSR sump vat and overflow is pumped into nearby 55-gallon drums. Spill over, washdown water, or any other wastes from the chemical formulating process is collected in this self-contained drainage system. The generated waste is analyzed and the majority is either recycled or discharged down the sanitary sewer collection system after neutralization. If determined hazardous it is retained in the permitted container storage area.

C/F Blending Room Drainage

This SWMU comprises an in-floor concrete trench topped with a metal grate encompassing the majority of the C/F Blending Room. This drainage system intercepts waste spillage or washdown water and has a maximum capacity of 100 gallons. An on and off valve connected to the C/F trench regulates, if this unit is continuous with the municipal sanitary sewer collection system. Generated wastes are analyzed and managed in the same manner as the VSR Blending Room.

Continuous Sewer Discharge Outlet and Associated Piping

The plant discharge drain is a 12-inch piping system which extends throughout the plant building. This drainage system intercepts spill over or washdown water from all concrete areas in the plant building except for the VSR and C/F Blending Rooms. However, during the writing of the final draft of this report, Olin Water Services/Drew reported to FIT that the VSR Blending Room self-contained drainage system had been eliminated and is currently connected with the plant's sewer discharge system. The newly incorporated drainage system has an on/off valve attachment to regulate drainage flow. The discharge outlet to the POTW is located on the southwest side of the plant building. Wastewater is analyzed and discharged to the Kansas River under the auspices of a pretreatment agreement with the city.

Dumpsters

This SWMU consists of two steel non-hazardous solid waste receptacles. The amount of solid waste varies throughout the year and consists mostly of scrap building material and clean, unuseable drums.

Satellite Accumulation Area (lab wastes)

This unit is inside the Olin laboratory and consists of a 5-gallon safety can and a 30-gallon drum of collected chlorinated solvents (F001). F001 wastes are stored in the 30-gallon drum until full, then sealed and moved to the permitted container storage area, until shipment.

Areas of Concern

During the VSI, two above-ground product storage tanks located on the east side of the production plant, were also inspected. A concern has been noted by a State official pertaining to an alleged spill around the northern-most storage tank (sodium hydroxide). However, FIT observed no evidence of a spill or potential problem with this area.

In 1986, a release did occur from the VSR sump vat located between the plant and the southern-most storage tank. The resulting problem revealed chromium contamination. To mitigate the problem, Olin formulated an overflow pumping and temporary storage system during the production of chromium products in the VSR blending area. No other releases around the sump vat area have been documented.

Olin was purchased by Drew Industrial Division in December 1989, and has future plans to construct a 16-tank farm in the east section of the production plant. Drew conducted an environmental audit in November 1989, including the installation of three monitoring wells, one of which is located in the eastern section of the Olin property. The results of this Pre-Acquisition Investigation indicated that the soil is contaminated with VOCs, PAHs, and metals in the eastern portion of the plant building, with the majority of the contamination around the former morpholine and cyclohexylamine tank. The investigation also showed that the ground water at the facility is contaminated, with the most significant contaminant being TCE at 34 µg/L in monitoring well #1. For

more details, see Sectin 5.7 and Appendix G.

Observations made during the April 1990 VSI of the above-mentioned SWMUs and the facility as a whole indicate that the operational procedures are of good standing. In general, the plant building and production yard was clean and well organized. Waste handling practices were acceptable, with no releases or spills noted.

SECTION 8: BIBLIOGRAPHY

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APPENDIX A

SITE PHOTOGRAPHS

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 1
Subject
Olin Water Services Plant Building and Warehouse.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1235 hours

Direction
Southeast

No: 2
Subject
Production Yard

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1237 hours

Direction
East

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 3
Subject
Production Yard Empty Drum Storage Area.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1145 hours

Direction
Southwest

No: 4
Subject
Hazardous Waste Container Storage Area

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1130 hours

Direction
Southwest

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 5
Subject
First row of the Hazardous Waste Container Storage Area.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1132 hours

Direction
South

No: 6
Subject
Second and third rows of the Hazardous Waste Container Storage Area.

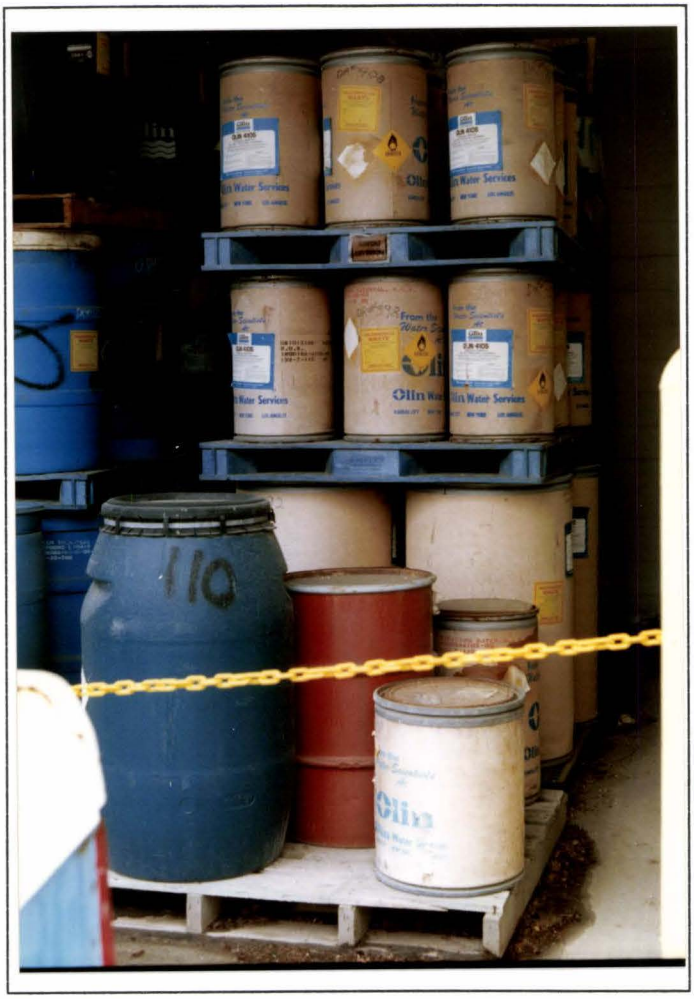
Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1134 hours

Direction
Southeast

PHOTOGRAPHIC RECORD



SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 7
Subject
Fourth row of the Hazardous Waste Container Storage Area.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1136 hours

Direction
South

No: 8
Subject
Sodium hydroxide tank. The tank capacity is 10,000 gallons.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1150 hours

Direction
Southwest

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 9
Subject
Empty product storage tank. The tank once contained flammable material. Capacity is 6,000 gallons.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1152 hours

Direction
Southwest

No: 10
Subject
Dumpster for non-hazardous solid waste disposal.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1145

Direction
Northeast

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 11
Subject
Contents of dumpster.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1147 hours

Direction
East

No: 12
Subject
Volatile Steam Return (VSR) blending room. In the background is VSR blending tank (capacity 2,000 gallons).

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1115 hours

Direction
Northeast

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 13
Subject
VSR Drum-off room. In background is the drainage outlet which leads to the containerized sump vat.

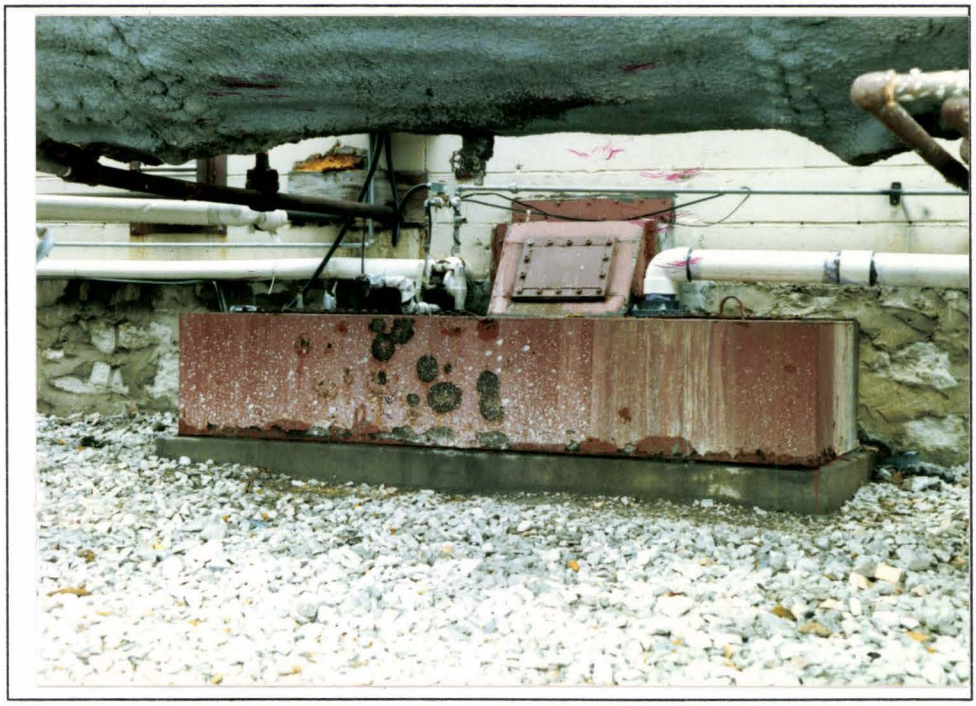
Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1117 hours

Direction
Southeast

No: 14
Subject
VSR sump vat.



Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1107 hours

Direction
West

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 15
Subject
VSR sump vat and piping system from VSR Drum-off room.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1109 hours

Direction
South

No: 16
Subject
Corrosive or Flammable C/F) blending room. In background is the C/F blending tank (capacity 2,000 gallons).

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1120 hours

Direction
Southwest

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD

SITE NAME: Olin Water Services

SITE LOCATION: Kansas City, Kansas

TDD/PAN#: F-07-9003-005/FKS0285RA

No: 17
Subject
C/F Blending room waste collection trench. Blue object is the on and off valve for disposal to the Fairfax sanitary sewer system.

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1122 hours

Direction
Northwest

No: 18
Subject
Sodium Chloride Blending room waste collection trench. Further north is the plant's discharge outlet to the Fairfax sanitary sewer system (not shown in photograph).

Photographer
Otavio Silva

Witness
Patty Roberts

Date/Time
4/27/90 - 1125 hours

Direction
West

Negatives for Photographic Record

Site Name OLIN WATER SERVICES

Site Location KANSAS CITY, KANSAS

TDD/PAN # F-07-9003-005/FKS0285RA

APPENDIX B

EPA PRELIMINARY ASSESSMENT FORM 2070-12

Ashland Chemical, Inc.
(Olin Water Services)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KS	KSD000203638

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Ashland Chemical, Inc. (Olin)	3155 Fiberglass Road				
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 COUNTY**	**07 COUNTY CODE**	**08 CONG DIST**
Kansas City	KS	66115	Wyandotte		
09 COORDINATES **LATITUDE**	**LONGITUDE**				
39° 08' 47.0" N	094° 36' 58.0" W				

10 DIRECTIONS TO SITE (Starting from nearest public road)

From I-635, exit on Kansas Highway 5 east. Stay on 5 Highway until Sunshine Road. Continue east on Sunshine Road until Fiberglass Road. Site is located at the intersection of Sunshine and Fiberglass roads.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)			
Drew Inc. (Ashland Chemical Co.)	P.O. Box 2219			
03 CITY	**04 STATE**	**05 ZIP CODE**	**06 TELEPHONE NUMBER**	
Columbus (Dublin)	OH	43216	(614) 889-3065	
07 OPERATOR (If known and different from owner)	**08 STREET (Business, mailing, residential)**			
Ashland Chemical Co.	3155 Fiberglass Road			
09 CITY	**10 STATE**	**11 ZIP CODE**	**12 TELEPHONE NUMBER**	
Kansas City	KS	66115	(913) 621-6410	

13 TYPE OF OWNERSHIP (Check one)

__X__ A. PRIVATE __ B. FEDERAL: _____ (Agency name) __ C. STATE __ D. COUNTY __ E. MUNICIPAL

__ F. OTHER: _____ (Specify) __ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

__X__ A. RCRA 3001 DATE RCVD: 11/18/80 MO/DAY/YR __ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RCVD: MO/DAY/YR __ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

__X__ YES DATE 04/27/90 MO/DAY/YR
__ NO

BY(Check all that apply)

__X__ A. EPA __X__ B. EPA CONTRACTOR __X__ C. STATE __ D. OTHER CONTRACTOR
__ E. LOCAL HEALTH OFFICIAL __ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): Ecology and Environment, Inc.

02 SITE STATUS (CHECK ONE)	03 YEARS OF OPERATION		
__X__ A. ACTIVE __ B. INACTIVE __ C. UNKNOWN	1970 BEGINNING YEAR	current ENDING YEAR	__ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

This facility generates hazardous wastes from the preparation of liquid and powder water treatment formulations. Wastes identified and stored at the facility include D001 to D003, and D007 characteristic wastes. Various U-listed wastes could also be present.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

No imminent threat to the environment and/or population. The VSR Sump should be routinely inspected for failure as no secondary containment is present.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous conditions and Incidents)

__ A. HIGH	__ B. MEDIUM	__ C. Low	__X__ D. NONE *Facility routinely inspected by RCRA
(Inspection required promptly)	(Inspection required)	(Inspect on time available basis)	(No further action needed. Complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)			03 TELEPHONE NUMBER
Mark Matthews	EPA/RCRA			(913) 551-7635
04 PERSON RESPONSIBLE FOR ASSESSMENT	**05 AGENCY**	**06 ORGANIZATION**	**07 TELEPHONE NUMBER**	**08 DATE**
Patty Roberts	E & E	FIT	(913) 432-9961	10/22/91 MO/DAY/YR

EPA FORM 2070-12 (7-81)

Ashland Chemical, Inc.
(Olin Water Services)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE KS	02 SITE NUMBER KSD00020368

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)
- X A. SOLID
- X B. POWDER, FINES
- ___C. SLUDGE
- ___D. OTHER (Specify)
- ___E. SLURRY
- X F. LIQUID
- ___G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)
- TONS
- CUBIC YARDS
- NO. OF DRUMS ~ 125

03 WASTE CHARACTERISTICS (Check all that apply)
- X A. TOXIC
- X B. CORROSIVE
- ___C. RADIOACTIVE
- ___D. PERSISTENT
- ___E. SOLUBLE
- ___F. INFECTIOUS
- ___G. FLAMMABLE
- X H. IGNITABLE
- ___I. HIGHLY VOLATILE
- ___J. EXPLOSIVE
- X K. REACTIVE
- X L. INCOMPATIBLE
- ___M. NOT APPLICABLE

III. WASTE TYPE (by waste characteristics)

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS	unknown	N/A	[methylene chloride, hydrazine, n-butyl
PSD	PESTICIDES			alcohol, 1,2-dichlorobenzene]
OCC	OTHER ORGANIC CHEMICALS	unknown	N/A	[pentachlorophenol, ethylenebis, salts,
IOC	INORGANIC CHEMICALS			and esters]
ACD	ACIDS	unknown	N/A	ethylenebisdithiocarbamic acid
BAS	BASES			
MES	HEAVY METALS	unknown	N/A	chromium

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	chromium	7440-47-3	drums	unknown	N/A
SOL	n-butyl alcohol	71-36-3	drums	unknown	N/A
SOL	1,2-dichlorobenzene	95-50-1	drums	unknown	N/A
SOL	[ethylenebisdithiocar-	111-54-6	drums	unknown	N/A
	amic acid]				
OCC	[ethylenebis salts and	[not available]	drums	unknown	N/A
	esters]				
SOL	hydrazine	302-01-2	drums	unknown	N/A
OCC	pentachlorophenol	87-86-5	drums	unknown	N/A
SOL	methylene chloride	75-09-2	drums	unknown	N/A

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA/RCRA files
April 27, 1990 E & E/FIT VSI

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KS	KSD00020368

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ___ A. GROUND WATER CONTAMINATION — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ B. SURFACE WATER CONTAMINATION — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ C. CONTAMINATION OF AIR — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ D. FIRE/EXPLOSIVE CONDITIONS — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ E. DIRECT CONTACT — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 X F. CONTAMINATION OF SOIL — 02 X OBSERVED (DATE: unknown) X POTENTIAL ___ ALLEGED
03 AREA POTENTIALLY AFFECTED: unknown (Acres) 04 NARRATIVE DESCRIPTION
The State has reported that the soil may be contaminated under the product (sodium hydroxide) storage tank, located east of the production plant.

01 ___ G. DRINKING WATER CONTAMINATION — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ H. WORKER EXPOSURE/INJURY — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___ I. POPULATION EXPOSURE/INJURY — 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
KS	KSD00020368

II. HAZARDOUS CONDITIONS AND INCIDENTS (CONTINUED)

01 ___J. DAMAGE TO FLORA 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___K. DAMAGE TO FAUNA 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)
None reported or known to date.

01 ___L. CONTAMINATION OF FOOD CHAIN 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___M. UNSTABLE CONTAINMENT OF WASTES 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
(Spills/runoff/standing liquids/leaking drums)
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___N. DAMAGE TO OFF-SITE PROPERTY 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION
None reported or known to date.

01 ___P. ILLEGAL/UNAUTHORIZED DUMPING 02 ___ OBSERVED (DATE: _____) ___ POTENTIAL ___ ALLEGED
04 NARRATIVE DESCRIPTION
None reported or known to date.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS
None reported or known to date.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

PA Form may be updated during Final Report submission to EPA.

V. SOURCES OF INFORMATION (Cite specific references. e.g., state files, sample analysis, reports)

EPA/RCRA files
April 27, 1990, E & E/FIT VSI

APPENDIX C

RAW MATERIAL NUMERICAL INDEX

NUMERICAL INDEX

Raw Material Code Number	Inventory Name	CAS No.
0004	Acetic Acid	64-19-7
0009	ACRYSOL® QR-1086	N.A.
0010	Actrafoam S	N.A.
0011	Aerosol GPG	577-11-7
0013	Agefloc WT-40	26062-79-3
0014	Agefloc A-50	42751-79-1
0015	Agefloc CF-50	1327-41-9
0016	Alumina-Hydrated	21645-51-2
0017	AMP-95	124-68-5
0018	Polyacrylic Acid	9003-01-4
0019	ALCOMER 123L	64742-47-8, 8032-32-4
0020	Aluminum Chlorohydrate Sol., 50%	1327-41-9
0021	Aquatreat DNM-30	128-04-1 & 142-59-6
0022	Aqua Ammonia	1336-21-6
0029	American Cyanamid E-1883	N.A.
0033	AF-10-FG	N.A.
0035	ARCO S-SMA-1000L/PERCHEM 5786/ VERSA-TL 7	(68037-40-1) 1310-73-2 - Sod. Hydrox.
0039	Armeen 18D	124-30-1
0040	BTC 1010	7173-51-5
0044	BARDAC 205M	68424-95-5
0045	Bayhibit AM	37971-36-1

0046	BARQUAT 4240Z	5197-80-8
0050	Belclene 200	26099-09-2
0051	Belclene 500	71050-62-9
0053	Belcor® 575	23783-26-8
0054	Biomet TBTO	56-35-9
0057	Bio-Terge PAS-8S	5324-84-5
0089	BTC-2125	68391-01-5* & 68956-79-6*
0091	Butyl Alcohol	71-36-3
0092	Poly-Solv EB	111-76-2
0106	CH-22HM	8002-05-9, 1309-48-4, 21645-51-2
0108	Caustic Soda	1310-73-2
0109	Calcium Nitrate	10124-37-5
0111	Calgon RP-1240-10	N.A.
0112	Caustic Soda	1310-73-2
0113	Caustic Potash Liquid	1310-58-3
0115	CDB Clearon	51580-86-0
0121	12% Manganese CEM-ALL	15956-58-8, 27253-32-3
0122	Chem-Solv DM	111-77-3
0123	Chem-Solv DB	112-34-5
0124	Chesnut Extract	1401-55-4
0125	CMC- 7LBT	9004-32-4
0126	Cobratec 99	95-14-7
0127	Cobratec TT-50 S	64665-57-2
0128	Chromic Acid	1333-82-0
0129	Citric Acid	77-92-9
0130	Cobalt Sulfate	10124-43-3
0136	Copper Sulfate	7758-99-8

0137	Copper Sulfate Liquid	7758-98-7
0139	Chlorine	7782-50-5
0143	POLY-TERGENT® CS-1	N.A.
0145	Cupric Nitrate, Trihydrate	10031-43-3
0148	Cyclohexylamine	108-91-8
0149	Cyanamer P-35	9003-06-9
0150	Cyanamer P-35	9003-06-9
0151	Cyanamer P-38	9003-06-9
0155	Dequest 2000/PHOS 2	6419-19-8
0156	Dequest 2010	2809-21-4
0158	Dequest 2005	2235-43-0
0159	Diethyl Ethanol Amine	100-37-8
0160	Disodium Phosphate	7558-79-4
0161	Disodium EDTA	139-33-3
0163	Ethylene Glycol, Inhibited	107-21-1
0164	POLY-TERGENT® 2EP	28519-02-0, 25167-32-2, 7757-82-6
0166	DANTOBROM® RW Biocide	126-06-7, 118-52-5 ACCESS #54445
0167	Diethylhydroxylamine (DEHA) (Hydroquinone)	3710-84-7 123-31-9
0180	Hampene 220	64-02-8
0183	Ethomeen 18/60	26635-92-7
0184	Ethomeen S/15	61791-24-0
0189	Exxon Aromatic 200	64742-94-5 64742-06-9 91-20-3
0192	Ferrous Sulfate/Heptahydrate	7782-63-0
0193	Ferric Chloride Solution	7705-08-0
0194	Ferric Sulfate Solution 50%	10028-22-5

		7664-93-9
0204	GOOD-RITE® K-XP82	9003-01-4
0206	GUARTEC CIP	68611-04-1
0209	HAMP-ENE® ACID	60-00-4
0211	HAMP-ENE® 100S	64-02-8
0212	Hampene 100/Vin Keel 100	64-02-8
0214	Hexametaphosphate (OLIN POLYPHOS® 62533-93-1)	68915-31-1
0226	Hybase M-12	68476-30-2 61789-87-5 546-93-0
0236	Hydrochloric Acid, Inhibited	7647-01-0
0237	Hydrogen Peroxide, 50%	7722-84-1
0239	Hydrazine 35%	302-01-2
0240	Hydroxyacetic Acid	79-14-1
0261	Kathon 886F	26172-55-4 2682-20-4
0273	Magnifloc 905N	N.A.
0275	Magnifloc 1820A	N.A.
0276	Magnifloc 587C/Agefloc WT-20 N.A. 2606-79-3	
0277	Magnifloc 581C/ CPS Agefloc A-50 HV	N.A. 42751-79-1
0283	Magnifloc 515-C	N.A.
0284	Magnifloc 1849-A	N.A.
0285	Magnifloc 1906N	N.A.
0286	Magnifloc 1596C	64742-47-8, 7783-20-2
0291	Maracell XE	68131-31-7
0293	Marasperse N-22	8061-51-6
0294	Mazu DF 210S	7732-18-5, 9003-04-7 9005-67-8, 9004-65-3 57-11-4, 1338-41-6 63148-62-9, 7631-86-9 50-00-0, 99-76-3 94-13-3, 57-55-6

0295	MECT 5	21564-17-0, 6317-18-6
0296	MECT 10	21564-17-0, 6317-18-6
-	Methyl Violet Indicator	N.A.
0304	Monosodium Phosphate	7558-80-7
0305	Monofax 1214	N.A.
0308	Morpholine	110-91-8
0312	Muriatic Acid	7647-01-0
0317	Narlex D-72	68037-40-1
0318	National Starch FLOC-AID 19	N.A.
0330	O B Hibit	1303-96-4, 532-32-1 7758-87-4, 7758-29-4 9003-11-6
0336	Sodium Chlorate (OPM-2)	7775-09-9
0340	PERCHEM™ 550	26062-79-3
0341	CALLAWAY 3379	N.A.
0342	Percol 710	64742-52-5 8032-32-4
0343	Percol 780	(8012-95-1 mineral oil)
0346	Percol LT 26	N.A.
0347	Percol 757	N.A.
0348	Percol 778	N.A.
0349	Percol LT 27	N.A.
0350	Petro AG Special	26264-58-4 27178-87-6
0353	Magnifloc 1594C	8002-05-9
0360	Phosphoric Acid	7664-38-2
0361	Phosphonic Acid, Green (70%)	7664-38-2
0364	Pluronic F-68	9003-11-6
0365	Olin Poly G WS-5100	9038-95-8
0368	Polyphosphoric Acid	8017-16-1
0370	Potassium Carbonate	584-08-7

0371	Potassium Hydroxide, Crystals	1310-58-3
0372	Potassium Tetra Borate	1332-77-0
0378	Praestol K 225 FL	N.A.
0379	Praestol K 280 FL	64742-47-8 9016-45-9
0380	Praestol K133L	64742-47-8 67-63-0
0381	Praestol A 310 FL	N.A.
0387	PRO FLOC P (Chitosan)	9012-76-4
0388	Propylene Glycol, Inhibited	57-55-6
0390	Quebracho	1401-55-4
0397	Percol LT22S	N.A.
0410	SECOFLOC 800	7647-01-0, 7732-18-5 141-43-5, 50-00-0
0420	Sodium Chloride	7647-14-5
0428	Santosite	7757-83-7
0430-0431-0432	Scav-Ox	302-01-2
0433-0439	Scav-Ox II (Organic Catalyst)	302-01-2
0435-0436-0437	Scav-Ox Plus	302-01-2
0440	Sodium Sulfate	7757-82-6
0441	Silicate of Soda	1344-09-8
0443	Sodium Carbonate, anhydrous	497-19-8
0444	Soda Ash	497-19-8
0452	Sodium Bichromate	10588-01-9
0455	Sodium Chlorite Solution 31%	7647-15-6
0456	Sodium Bisulfate	7681-38-1

0457	Sodium Chlorate (99.5%)	7775-09-9
0458	Sodium Borate - $5H_2O$	1330-43-4
0459	Sodium Chlorite	7758-19-2
0460	Sodium Chlorite (Technical) 50%	7758-19-2
0461	Sodium Chromate	7775-11-3
0462	Sodium Carbonate Solution	N.A.
0463	Sodium Citrate, dihydrate	68-04-2
0464	Sodium Hydrosulfite	7775-14-6
0465	Sodium Hypochlorite	7681-52-9
0466	Sodium Bisulfite, Anhydrous	7681-57-4
0468	Sodium Meta Silicate	6834-92-0
0469	Sodium Molybdate	7631-95-0
0471	Sodium Sulfide, Flake	1313-82-2
0480	Sodium Nitrite	7632-00-0
0481	Wayzole TT-85S/Cobratec TT85	64665-57-2
0482	Sodium Polymethacrylate	N.A.
0483	GOOD-RITE K-XP82D	9003-04-7
0484	Sodium Sesquicarbonate, dihydrate	533-96-0
0485	Sodium Polyphosphates, Glassy	68915-31-1
0488	Sulfamic Acid	5329-14-6
0489	Starch	9005-25-8
0491	Sulfuric Acid 66° Be	7664-93-9
0493	Sybron Bi-Chem LC 1002 CG - 1738 Blend	N.A.
0494	Sybron Bi-Chem DC 1002 CG - 1738 Blend	N.A.
0495	Sybron Bi-Chem LC 1002 CG	N.A.
0496	Sybron Bi-Chem DC 1002 CG	N.A.
0497	Sybron Bi-Chem LC 1008 SF	N.A.

0498	Sybron Bi-Chem DC 1008 SF	N.A.
0499	Sybron Bi-Chem LC 1738 CW	N.A.
0500	Sybron Bi-Chem DC 1738 CW	N.A.
0501	Sybron Bi-Chem LC 1008 SF - 1738 Blend	N.A.
0502	Sybron Bi-Chem DC 1008 SF - 1738 Blend	N.A.
0505	T DET N-11	9016-45-9
0518	Poly-Tergent B-350	26027-38-3
0520	Poly-Tergent SL-62	N.A.
0521	Poly-Tergent S-305-LF	N.A.
0525	TPPP Solution	7320-34-5
0526	Tetrapotassium Pyrophosphate, Powder	7320-34-5
0527	Tetrasodium pyrophosphate (TSPP)	7722-88-5
0528	Tolutriazole	29385-43-1
0532	Triethanolamine 99%	102-71-6
0533	Triethanolamine 69.3%	102-71-6
0534	Tripolyphosphate	7758-29-4
0538	Tri Sodium Phosphate	7601-54-9
0540	Triton X-114	9036-19-5
0541	Triton X-100/Harcros-DET 0-9	9036-19-5
0542	Triton CF-54	69279-01-2

0584	Methylene Bis Thiocyanate	6317-18-6 64742-95-6
0590	WSCP	31512-74-0
0596	XD-7287 L	10222-01-2 112-60-7 25322-68-3 7732-18-5 7647-15-6
0597	Witconate P-10-59	26264-05-1
0602	Zinc Chloride Solution	7646-85-7
0609	Zinc Nitrate 50%	7779-88-6
0610	Zinc Oxide	1314-13-2
0620	Zinc Sulfate	7733-02-0
OLIN 1803	Sodium Sulfite, Synthetic Anhydrous Catalyzed & Decharacterized	7757-83-7 68131-31-7 10124-43-3
OLIN 1804	Sodium Sulfite, Catalyzed	7757-83-7 10124-43-3

APPENDIX D

HAZARDOUS WASTE CONTAINER STORAGE AREA INVENTORY LIST

PRODUCT: CHROME WOOD EPTOXIC	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
	12-19-86	135	3074	3074	2 BINS, 1 PALLET	2 BINS, 1 PALLET

PRODUCT: OLIN 3102 STP TOXIC	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
	2-25-85	105	150	150	1	1

PRODUCT: OLIN 6901 EPTOXIC

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
2-19-85	104	940	940	4	4

PRODUCT: OLIN 2806 CORR. - 60 TOXIC	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
	2-5-95	101	6500	6500	13	13

PRODUCT: BAD MONOMER
CORR - UP TOXIC

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
2-5-85	099	291	291	1	1

PRODUCT:
EXPER. 0846-38
CORR + ED TOXIC (clone)

	1	2	3	4	5	6
	DATE IN LOG	WORS	NET POUNDS	BALANCE	DRUMS ENTRY	DRUMS BAL.
1	3-21-84	070A	3500	3500	5	5
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PRODUCT:	1 DATE IN LOG	2 WORS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
OLIN 2059 CP TOXIC	7-6-83	037	400	400	1	1

PRODUCT	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
OGIN 2060 EP TOXIC	7-6-83	036	1200	1200	3	3

PRODUCT	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
CHROME BASED SLUDGE EP TOXIC	7-6-83	054	343	343	1	1

PRODUCT: Mixed Lab Solvents F001

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	10-16-87	157	1176	1176	3	3
2	10-20-87	157	<1176>	0	<3>	0
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Attachment 5

PRODUCT: OGIN 4105 IGN-OXIDIZER

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	11-3-81	005	590	590	1	1
2	3-14-85	111	2530	3120	22	23
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D001

PRODUCT: RESINEW FLAM. SOLID

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	10-23-88	002	4055	4055	9	9
2	12-30-88	002	<995>	3060	<2>	7
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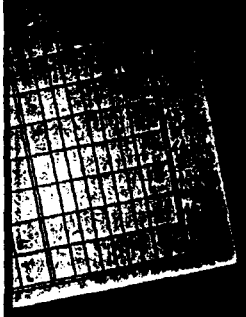

PRODUCT: OLIN 3301 COMBUST. LIQ.

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	7-6-83	052	487	487	1	1
2	9-20-84	052	475	962	1	2
3	3-14-85	052	450	1412	1	3
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PRODUCT:
Expon. 0822-37
FLAM. LIQ.

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	7-6-83	031	4396	4396	12	12
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PRODUCT: OGIN 2802 IGN.-OX.

1 DATE IN LOG	2 RNDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
6-28-82	057	456	456	1	1

POUNDS:
LAB WASTE
TOXIC - IGN.

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	2-17-84	118	50	50	1	1
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PRODUCT: OLIN 6988 IGN.

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
2-19-85	103	5850	5850	13	13
2-19-87	✓	<900>	4950	<2>	11
10-19-87	✓	<450>	4500	<1>	10
11-2-87	✓	<1350>	3150	<3>	7

PRODUCT: ADP-X2

IGN.

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	5-6-85	117	3521	3521	8	8
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PRODUCT: OLIN 6980 IGN.

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS GENTRY	6 DRUMS BAL.
1-8-86	123	5295	5295	11	11

PRODUCT: 0845-38 / WASTE OIL CLEAN OUT IGN.

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
7-18-86	136	2175	2175	5	5

PRODUCT:
INTERMEDIARY "CC"
Ignitable - D001

1 DATE IN LOG	2 WORKS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL
6-22-88	181	332	332	1	1

PRODUCT:
DCIN 6990
Ignitable - D001

1 DATE IN LOG	2 WORKS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
6-22-88	182	465	465	1	1

PRODUCT: Cronox 230 Eqn. D001

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
10-26-88	204	340	340	1	1

PRODUCT:
OCIN 6994
Eqn.- D001

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL
1	11-14-88	208	3200	3200	8	8
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PRODUCT:
OHN 5025
Ign-D001

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL
1	4-7-89	215	1860	1860	4	4
2						
3						
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PRODUCT:
OLIN 6110
Conc. D002

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
11-4-89	220	5828	5828	6466	
11-4-89	220	(5828)	0	0	

PRODUCT:
OLIN 2608
Corr. D002

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	4-7-89	214	1770	1770	6	0
2	10-4-89	214	<1770>	0	<6>	0
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PRODUCT: OLIN 5113 CORR. D002

	1 DATE IN LOG	2 WORKS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	6-29-88	190	960	960	2	2
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PRODUCT:
LAB SUPPLY WASTE - BASE CORROSIVE - D002

	1	2	3	4	5	6
	DATE IN LOG	WORKS	NET POUNDS	BALANCE	DRUMS ENTRY	DRUMS DAL
1	4-8-88	177	340	340	1	1
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PRODUCT: LAB SUPPLY WASTE-ACID CORROSIVE - D002

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	6-8-88	176	335	335	1	1
2	6-20-88	176	<335>	0	<1>	0
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PRODUCT: OKIN 2608 CORROSIVE

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	2-2-88	160	27500	27500	5	5
2	4-18-88	160	<27500>	-0-	<5>	-0-
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PRODUCT: OLIN 2104 CORR.

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
1	9-20-84	085	9000	9000	18	18
2	1-13-86	125	1000	10,000	2	20
3	11-24-86	125	<1000>	9000	<2>	18
4	11-24-86	085	<500>	8500	<1>	17
5	2-20-87	085	<1000>	7500	<2>	15
6	4-24-87	085	<2500>	5000	<5>	10
7	6-18-87	085	<2500>	2500	<5>	5
8	6-19-87	085	<2500>	0	<5>	0
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PRODUCT: REAGENT WASTE CORR.

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
7-5-62	056	371	371	1	1
6-9-87	056	(371)	0	(1)	0

Pulled from waste storage area 6/8/87 to include in reagent waste program.

W. Fuhrmann

PRODUCT: BUCKMAN SDMBT CORR	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
	6-30-86	134	2426	2426	5	5

Nov. 4, 1987 - Added 2 lbs. Sulfuric Acid to each drum to drop pH to 12.5 - No longer Hazardous waste.

Wyatt Evans

PRODUCT: DCIN 6900 4070

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL
1	11-14-88	209	1055	1055	3	3
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PRODUCT: Sodium Pentachlorophenate Toxic - U242	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
	2-29-88	170	366	366	1	1

PRODUCT:
Orthodichlorobenzene
TOXIC 4070

	1 DATE IN LOG	2 WORS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL
1	6-22-88	179	1941	1941	4	4
2	5-26-89	—	(1941)	0	(4)	0
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PRODUCT: Plant Drain Waste EP TOXIC D007

1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS ENTRY	6 DRUMS BAL.
4/18/88	172	1218	1218	2	2

PRODUCT: VSR DRAIN WASTE GP TOXIC. CHROME

	1 DATE IN LOG	2 WDRS	3 NET POUNDS	4 BALANCE	5 DRUMS GNTRY	6 DRUMS BAL.
1	1-17-85	092	370	370	1	1
2	1-17-85	093	341	711	1	2
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APPENDIX E

WASTE WATER DISCHARGE PERMIT

WASTEWATER DISCHARGE PERMIT

CITY OF KANSAS CITY, KANSAS
WATER POLLUTION CONTROL DEPARTMENT

Permit #	I880	Issue Date	November 14, 1989
Permit Type	Permanent	Expiration Date	November 14, 1994
Classification	II	Amount	$40.00

The below named holder of this permit may discharge wastewater into the Municipal sewer system in accordance with wastewater characteristics as listed and City Ordinance #51421.

Olin Water Services
(Firm)

3155 Fiberglas Road
(Street Address)

Kansas City, Kansas 66115
(City, State and Zip Code)

Special Conditions: (1) Report all accidental spills by phone and in writing to the Water Pollution Control Department at (913) 371-4240. (2) See Pages 2-7.

Important: This permit has been issued based on the information provided on your permit application and/or surveillance by the Water Pollution Control Department. A new discharge permit shall be required when the wastewater characteristics indicated on this permit are exceeded.

APPROVED: _____
DIRECTOR

11.14.89

KANSAS CITY, KANSAS WATER POLLUTION CONTROL DEPARTMENT
WASTEWATER DISCHARGE PERMIT

Company Name: Olin Water Services Permit Number: I880

I. WASTEWATER DISCHARGE AND MONITORING REQUIREMENTS

A. The permittee is authorized to discharge wastewater which does not exceed the following limitations:

Parameter	Maximum Daily Concentration Limit (mg/L)		Average Monthly Concentration Limit (mg/L)	Type of* Monitoring	Sample Type Required**	Frequency
CN Cyanide		2.0		E, SV, SF	G	*4 Days/6 Mo.
Cd Cadmium		1.5		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Cr Chromium		4.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Cu Copper		3.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Pb Lead		2.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Zn Zinc		5.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Ni Nickel		5.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Hg Mercury		0.3		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
As Arsenic		1.0		E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Ag Silver				E, SV, SF	24 Hr. (F)	3 Days/6 Mo.
Sulfides		1.0		E, SV, SF	G	3 Days/6 Mo.
Surfactants		100		E, SV, SF	G	3 Days/6 Mo.
Oil & Grease		100		E, SV, SF	G	*4 Days/6 Mo.
TTO				E, SV, SF	G	3 Days/6 Mo.
Total Metals				E, SV, SF		3 Days/6 Mo.
pH	X	5.5-9.5		E, SV, SF	G	*4 Days/6 Mo.

NOTES:

1. All metals and cyanide parameters are to be reported as Total (T).

2. Limits were not adjusted using the combined wastestream formula, as per (Part 403.6(E)). (Refer to Attachment A, if necessary.)

3. If there were two limitations for the same parameters, the most stringent limitation was used.

4. "(X)" in Table A will denote the parameters to be analyzed by your industry.

5. Total Suspended Solids (TSS), Biochemical Oxygen Demand (BOD), and Chemical Oxygen Demand (COD) will be required for Industrial Self-Monitoring and City Surveillance Monitoring, in addition to those parameters listed in Table A above.

*E - Enforcement Monitoring
SV - City Surveillance Monitoring
SF - Industrial Self-Monitoring
**(G) = Grab; (T) = Time Composite; (F) = Flow Composite 24 Hours

Company Name: Olin Water Services Permit Number: I880

B. The permittee shall not discharge any wastewater:

1. Having a pH lower than 5.5 or higher than 9.5.

2. Containing any other prohibited substance or material in accordance with the Code of City Ordinances, Chapter 30, Articles I-VII.

C. **Sampling Location (Describe)**

Sample point is located on the far west of the plant drain on the south end of the building.

D. **Testing Procedures**

Analyses of pollutants shall be performed by a laboratory certified by the Kansas Department of Health & Environment in accordance with techniques prescribed in 40 CFR, Part 136, as amended. Samples shall be taken in compliance with the monitoring requirements specified and shall be taken at the above-mentioned location (Part C) and at a time in which the sample will be representative of the permittee's wastewater discharge as it enters the City sewer system during normal working hours.

Schedule of Semi-Annual Reporting Periods

Sampling Period	Report Due
3 Consecutive Process Days Between April 15 - May 30	June 30
3 Consecutive Process Days Between Oct. 15 - Nov. 30	December 31

These reports shall be submitted to the Department at the following address:

Water Pollution Control Department
Municipal Office Building
701 N. 7th Street, Room 421
Kansas City, Kansas 66101

Additional Sampling

If the permittee monitors any pollutant at the location designated herein more frequently than required by this permit using approved analytical methods as specified in Part D, the results of such monitoring results shall be provided to the Department.

KANSAS CITY, KANSAS WATER POLLUTION CONTROL DEPARTMENT
WASTEWATER DISCHARGE PERMIT

Company Name: Olin Water Services Permit Number: I880

II. PERMIT CONDITIONS

1. **SCHEDULE OF COMPLIANCE:** Not later than 10 days following each date in the "Schedule of Compliance" and the final date for compliance, the authorized representative of the permittee shall submit a progress report to the Department, including, as a minimum, whether or not it complied with the increment of progress to be met on such date and, if not, the date on which it expects to comply with this increment of progress; the reason for delay; and the steps being taken by the user to return the construction to the schedule established.

   The permittee shall achieve compliance with the requirements specified in this permit in accordance with the following schedule:

	EVENT	DATE
a.	Submit Baseline Report (BR)	
b.	Submit Initial Quarterly or Semi-Annual Monitoring Report	June/December
c.	Achieve Compliance With Prohibited (Local) Discharge Limits	
d.	Achieve Compliance With Categorical (Federal) Discharge Limits	
e.	Accidental Spill Prevention Plan	On File: 10-26-89
f.	Compliance Progress Report	
g.	90 Day Compliance Report	
h.	Retain All Records	3 Years

   i. Nothing in this permit shall be construed to modify in any way the requirements of the Federal Clean Water Act, 33 U.S.C. Section 1251 et seq., pertaining to the pretreatment of discharges into publicly owned treatment works, including the General Pretreatment Regulations, 40 CFR Part 403, and any applicable Categorical Pretreatment Standards, 40 CFR Chapter 1, Subchapter N, nor shall this permit be construed to affect in any way the liability of the permittee for any failure to comply with such requirements.

Company Name: Olin Water Services Permit Number: I880

2. **SLUG LOADS OR ACCIDENTAL DISCHARGES:** The Director or his representative shall be notified immediately of any known slug load or accidental discharge into the municipal sewer system by phone (371-4240) and within ten (10) days in writing. This notification shall be a detailed statement describing the causes of the accidental discharge and the measures being taken to prevent future occurrence. Notification will not relieve users of liability for any expense, loss, or damage to the sewer system, treatment plant, or treatment process, or for any fines imposed on account thereof by any public, State, or Federal agency.

3. **PROPER DISPOSAL OF PRETREATMENT SLUDGES AND SPENT CHEMICALS:** The disposal of sludges and spent chemicals generated shall be done in accordance with Section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act, as specified in the solvent management plant.

4. **PERMIT MODIFICATIONS:** During the term of the permit, the conditions may need to be revised to meet federal requirements. In addition, permit conditions may change if the discharge from any permittee causes excessive operation and/or maintenance problems in the wastewater collection system and/or wastewater treatment plant.

   This permit shall be modified within nine (9) months of the promulgation of a National Categorical Pretreatment Standard. Compliance with the standard shall be within the timeframe specified in the applicable standard.

5. **PERMIT TRANSFERS:** This permit is issued to a specific user for a specific operation. It shall not be reassigned or transferred or sold to a new owner, new user, different premises, or to a new or changed operation without Department approval. Sale of a user's facilities shall obligate the purchaser to seek prior written approval from the Director to enable the discharge to continue.

6. **REVOCATION OF PERMIT:** The permit issued to the Industrial User by the City may be revoked when, after inspection, monitoring, or analysis, it is determined the discharge of wastewater to the sanitary sewer is in violation of Federal, State, or local laws, ordinances, or regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the permit application or any other required reporting forms may be cause for permit revocation. Upon revocation of this permit, all wastewater discharges to the sewer system shall be immediately ceased.

Company Name: Olin Water Services Permit Number: I880

7. **REPORTING CHANGE IN DISCHARGE:** Any change of more than 10 percent in discharge strength or volume, modification of waste collection or a pretreatment system, elimination of a discharge, changes in operational procedures, or other factors which would significantly alter the nature and frequency of discharge, shall be reported to the Director in writing.

8. **CONTROL STRUCTURE (MANHOLE):** When required by the Director, the Owner of any property serviced by a building sewer carrying industrial wastes shall install a suitable control manhole, together with such necessary meters and other appurtenances in the building sewer, to facilitate observation, sampling, and measurement of the wastes. Such a manhole, when required, shall be accessible 24 hours per day, safely located, installed by the Owner at his expense, and maintained by him so as to be safe and accessible at all times.

9. **PREVENTION PLAN:** The Industrial User shall develop an accidental spill prevention plan to eliminate or minimize the accidental or slug discharge of pollutants into the sewer system which could have an adverse effect on the City's pretreatment plant, sludge, or collection system.

10. **RIGHT OF ENTRY:** The Industrial User shall, after reasonable notification by the City, allow the City or its representative exhibiting proper credentials and identification to enter upon the premises of the User at all reasonable hours for the purpose of inspection, sampling, or records inspection. Reasonable hours in the context of inspection and sampling includes any time the Industrial User is operating any process which results in a process wastewater discharge to the City's sewer system.

11. **DILUTION:** No Industrial User shall increase the use of portable or process water or in any way attempt to dilute a discharge as a partial or complete substitute for adequate pretreatment to achieve compliance with the limitations contained in this permit. Dilution is not treatment.

12. **SIGNATORY REQUIREMENTS:** All reports required by this permit shall be signed by a principal executive officer of the User or his designee.

13. **FALSIFYING INFORMATION OR TAMPERING WITH MONITORING REQUIREMENTS:** Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or method inaccurate may

result in punishment under the criminal laws of the City, as well as being subjected to civil penalties and relief.

14. **BYPASSING:** Any diversion from or bypass of facilities necessary to maintain compliance with this permit is prohibited.

15. **REMOVAL FROM SERVICE:** The permittee shall inform the Department before an industrial waste treatment facility is removed from service.

16. **POLLUTANTS:** In the event the Environmental Protection Agency amends or promulgates new effluent or applicable toxic pollutant limitations for any of the pollutants which are more stringent than limitations specified in this permit, the permit will be modified and reissued to incorporate the new limitation(s).

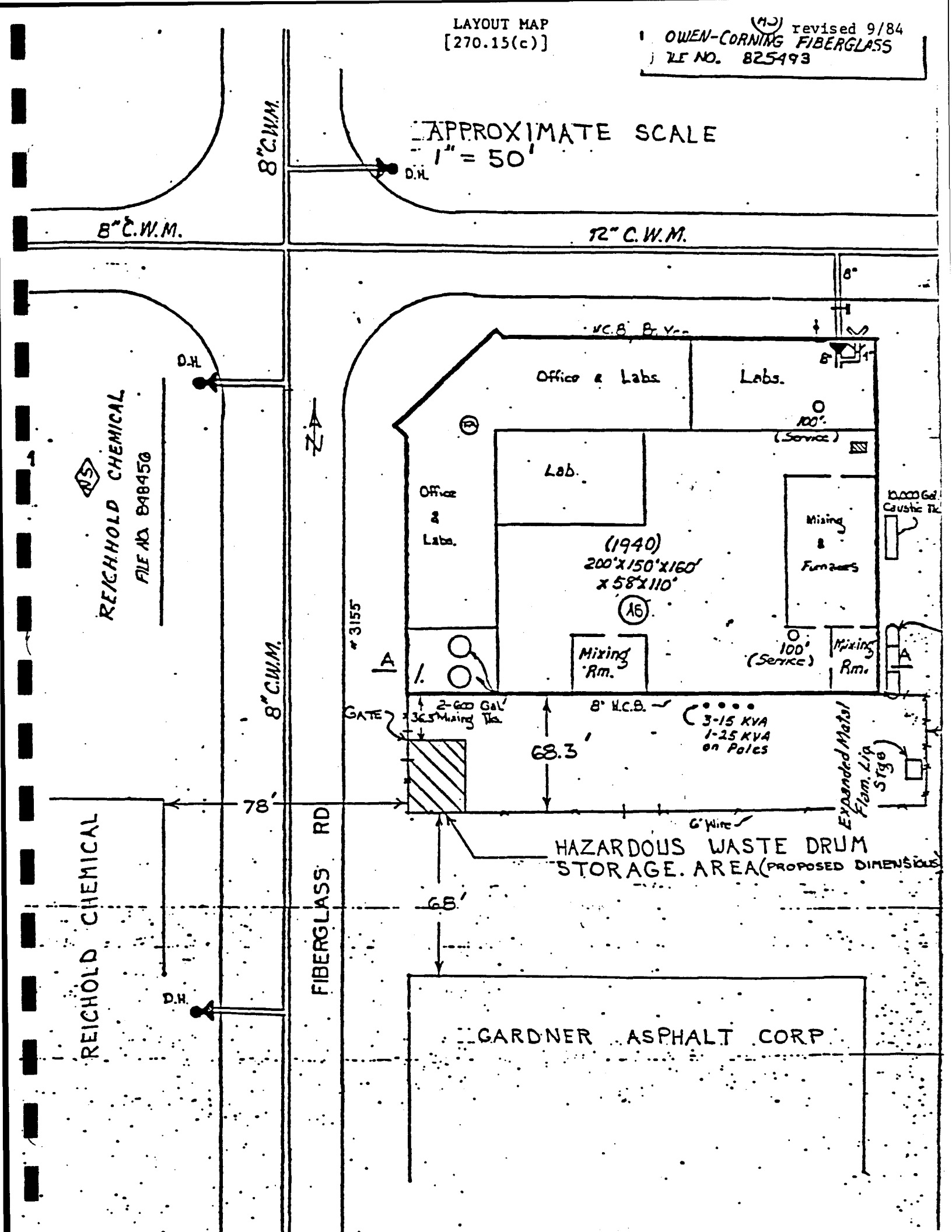
17. **ENFORCEMENT:** Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for violations and/or non-compliance as specified in this permit or City ordinances, whether or not such violations and/or non-compliance are due to factors beyond the permittee's control.

18. **SEVERABILITY:** The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

LAYOUT MAP
[270.15(c)]

(43) revised 9/84

OWEN-CORNING FIBERGLASS
ILE NO. 825493



APPENDIX F

WASTE WATER DISCHARGE SAMPLING RESULTS

Olin
WATER SERVICES

Olin Plant
Kansas City, KS

PRODUCT - SPECIAL ANALYSIS
DATA ONLY

Laboratory No.: 90Q0003
Date Collected: 01/05/90
Date Received: 01/09/90
Date Analyzed: 01/12/90
Analyst: DH/js

1 - 90Q0003 Plant Drain

CONSTITUENT	expressed as mg/L	1
pH (neat)	units	7.95
Chemical Oxygen Demand	COD	30
Zinc	Zn	0.64
Copper	Cu	<0.1
Chromium	Cr	<0.1
Nickel	Ni	<0.1
Lead	Pb	<0.1

B.Dame B. Whiles LF

Olin
WATER SERVICES.

Olin Plant
Kansas City, KS

PRODUCT - SPECIAL ANALYSIS
DATA ONLY

Laboratory No.: 90Q0006
Date Collected: 01/10/90
Date Received: 01/12/90
Date Analyzed: 01/12/90
Analyst: DH/js WS

1 - 90Q0006 Plant Drain Collected 2:45 p.m.

CONSTITUENT	expressed as mg/L	1
pH (neat)	units	7.6
Chemical Oxygen Demand	COD	145
Zinc	Zn	0.11
Copper	Cu	<0.1
Chromium	Cr	<0.1
Nickel	Ni	<0.1
Lead	Pb	<0.1

B.Dame B. Whiles LF

Olin
WATER SERVICES

Olin Plant
Kansas City, KS

PRODUCT - SPECIAL ANALYSIS
DATA ONLY

Laboratory No.: 90Q0005
Date Collected: 01/11/90
Date Received: 01/12/90
Date Analyzed: 01/12/90
Analyst: DH/js

1 - 90Q0005 Plant Drain Collected 3:00 p.m.

CONSTITUENT	expressed as mg/L	1
pH (neat)	units	7.7
Chemical Oxygen Demand	COD	80
Zinc	Zn	0.10
Copper	Cu	<0.1
Chromium	Cr	<0.1
Nickel	Ni	<0.1
Lead	Pb	<0.1

B.Dame B. Whiles LF

Olin
WATER SERVICES.

Olin Plant
Kansas City, KS

PRODUCT - SPECIAL ANALYSIS
DATA ONLY

Laboratory No.: 90Q0007
Date Collected: 01/12/90
Date Received: 01/16/90
Date Analyzed: 01/16/90
Analyst: DH/js

1 - 90Q0007 Plant Drain Collected 3:00 p.m.

CONSTITUENT	expressed as mg/L	1
pH (neat)	units	8.5
Chemical Oxygen Demand	COD	150
Zinc	Zn	1.62
Copper	Cu	<0.1
Chromium	Cr	<0.1
Nickel	Ni	<0.1
Lead	Pb	<0.1

B.Dame B. Whiles LF

OLIN CORPORATION
P O BOX 15037, KANSAS CITY KS 66115-0037, (913) 621-2021

APPENDIX G

ASHLAND PRE-ACQUISITION PRELIMINARY ENVIRONMENTAL ASSESSMENT REPORT

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
DRAFT REPORT OF FINDINGS
PRELIMINARY ENVIRONMENTAL ASSESSMENT
OLIN WATER SERVICES
KANSAS CITY, KANSAS
AS EDITED BY
GROUNDWATER TECHNOLOGY, INC.

PREPARED FOR:

WILLIAM C. OLASIN
ENVIRONMENTAL ENGINEER
ASHLAND CHEMICAL, INC.
P.O. BOX 2219
COLUMBUS, OHIO 43216

PREPARED BY:

MARK P. DAVIS
GEOLOGIST

REVIEWED BY:

RONALD M. KLEMOVICH, P.E.
PROJECT MANAGER

FOR:

MICHAEL R. BRENOEL
VICE PRESIDENT
REGIONAL MANAGER

JUNE 24, 1991
042601057

c:\klem\ashland\1

GROUNDWATER TECHNOLOGY

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GROUNDWATER TECHNOLOGY

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Appendix A Boring and Well Completion Logs

Appendix B Analytical Results

1.0 INTRODUCTION

At the request of Ashland Chemical, Inc. (Ashland), a preacquisition preliminary environmental site assessment was performed in November, 1989, by Civil & Environmental Consultants (CEC), of Pittsburgh, Pennsylvania, at the Olin Water Services facility, 3155 Fiberglas Road, Kansas City, Kansas. CEC's Report of Findings, dated December 18, 1989, was prepared for and reviewed by Ashland for purposes of decision making regarding purchasing the property.

Groundwater Technology, Inc. (Groundwater Technology) was requested to edit and redraft the document to remove references relating to: conjecture, information redundancy, speculative recommendations and cost estimates, subjective conclusions, unbased qualifications, or other Ashland property acquisitions. The intent of the editing process performed by Groundwater Technology was to produce a concise statement of the facts and presentation of CEC's findings and data for submittal by Ashland to the Kansas Department of Health and Environmental (KDHE). No deletion of raw data or modifications to any of the original Figures or Tables from the CEC document, as received by Groundwater Technology, has been performed. For purposes of this presentation, original copies of CEC's Figures and Tables are included and referenced herein. No validation or technical review of any analytical data has been performed by Groundwater Technology. Groundwater Technology's quality control consistent with that of preparing and editing a consulting document for presentation to a client has been performed.

2.0 FACILITY DESCRIPTION

The Olin Water Services facility in Kansas City produces water-treatment products for reduction of boiler scale, biocidal, and other industrial water treatment applications. Raw materials are mixed in tanks within the manufacturing portion of the facility, and then transferred to appropriate containers for distribution.

The western portion of the property is owned by Olin, and is bounded on the east by railroad tracks, and on the north and west by public streets. The facility includes a manufacturing building, a drum storage area, and a hazardous-waste storage area (**Figure 1**). Immediately east of the manufacturing building are two aboveground product-storage tanks, which were installed in 1965. The northern tank is, and has been historically, used for storage of 50% sodium hydroxide (caustic). The southern tank is internally divided into three 2,000-gallon compartments. the southern compartment is used for morpholine storage, and the northern compartment is used to store cyclohexylamine. The center tank has historically been used for storage of several different materials. Initially, kerosene was stored in the center section. In the early 1970's, kerosene usage declined, and the compartment was then used for storage of aromatic naphtha. Around 1985, naphtha use was phased out, and the section filled with cyclohexylamine, which is currently stored in the tank.

The eastern portion of the facility is leased and used for Olin offices, as well as warehousing and shipping operations. Olin leases approximately two-thirds of the building, while the other third is currently vacant.

The eastern and western portions of the facility are separated by a railroad spur currently in sporadic use. Another railroad spur is located east of the leased building.

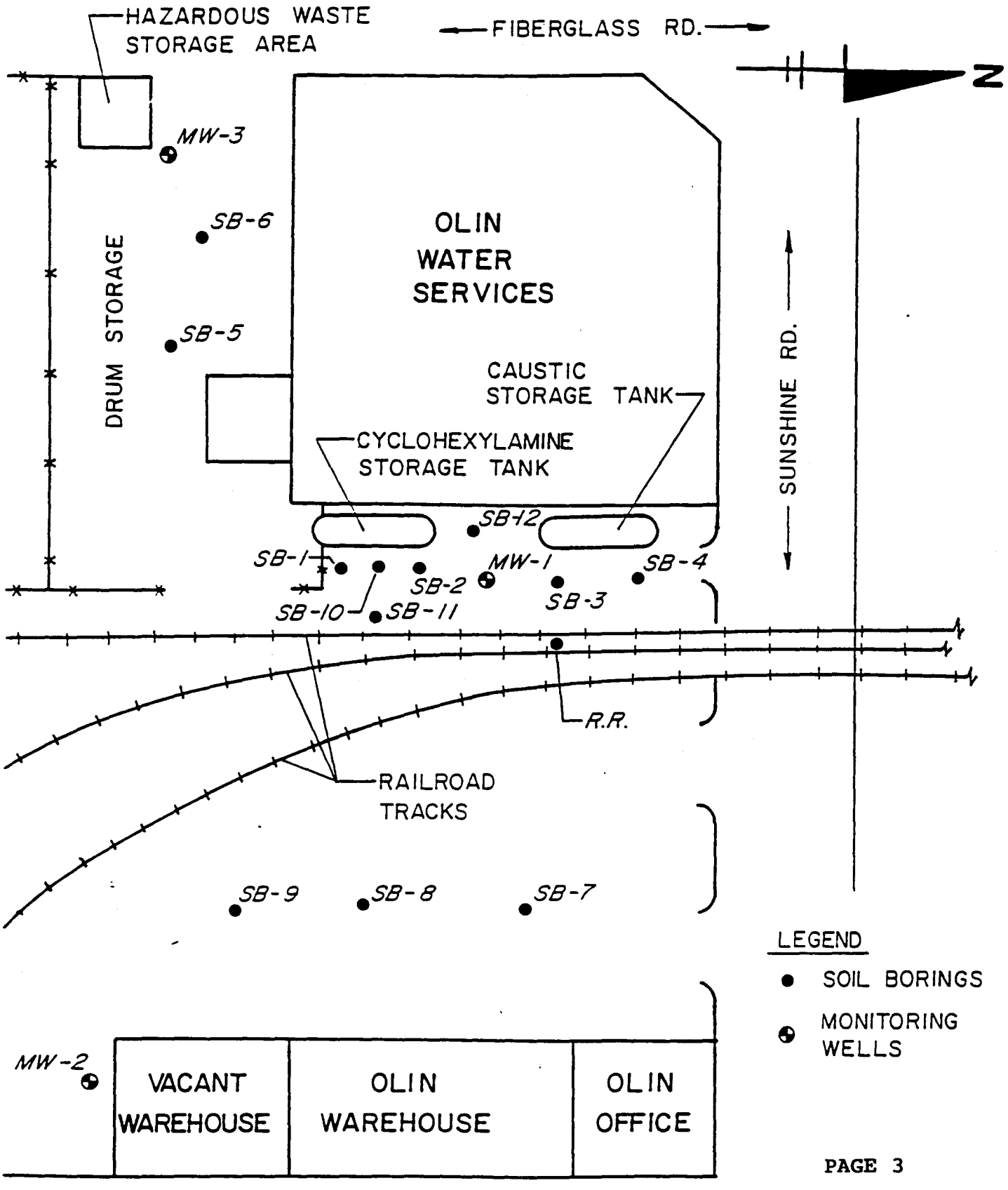


FIGURE 1

Civil & Environmental Consultants, Inc.	DATE: 12/1/89	APPROVED BY:	DWN. BY: M.T.M
	SCALE: NTS		CHKD. BY:
	SITE LAYOUT OLIN WATER SERVICES KANSAS CITY, KS		SHEET 1 OF 1
			DRAWING NUMBER 89208-A1

3.0 PHYSICAL SETTING

The Olin Water Services facility is located in the Fairfax Industrial District or northern Kansas City, Kansas, approximately one-half mile south of the Missouri River.

Borings installed by CEC at the site indicate that the site is underlain by approximately 12 feet of clayey silt. Beneath the silt is a fine, uniform sand that reportedly coarsens with depth, and immediately overlies bedrock. The thickness of this unit is not known. The water table occurs approximately 18 to 20 feet below grade in the sand unit. Regional groundwater flow in the water table aquifer is apparently to the north and east, toward the Missouri River.

The Fairfax District of Kansas City is largely an industrial area with many types of businesses present. Historical records indicate the area has been the site of industrial activity for several decades. Businesses adjacent to the Olin property include Rheinhold Chemical Company to the west, and Owens-Corning Fiberglas to the north.

4.0 CEC SCOPE OF WORK

In order to investigate the possibility of environmental contamination at the site prior to acquisition by Ashland, CEC proposed the following scope of work:

1. Installation of four shallow monitoring wells to allow collection of groundwater samples for analysis of Target Compound List (TCL) organics, as well as Target Analyte List (TAL) metals.

2. Advancement of nine shallow soil borings to allow collection of subsurface soil samples for TCL organics and TAL metals analyses.

3. Survey of wellhead elevations to determine groundwater flow directions based on measured static water levels in the new monitoring wells.

4. Title review and deed search to determine past ownership of the property and possible associated land use.

5. Preparation of a final report detailing our findings and interpretations.

5.0 METHODOLOGY

5.1 CEC SOIL BORINGS

The soil borings at the Olin facility were advanced using 3-1/4 inch I.D. hollow-stem augers and a CME 5-foot continuous split-spoon sampler. After reaching the desired depth, the sampler was removed from the hole and the sample examined for geologic materials, visible signs of contamination, and scanned for the presence of organic vapors using the HNu photoionizer. Appropriate portions of the samples were placed in laboratory-supplied jars in anticipation of submittal to the laboratory for required analyses. After completion of each boring, augers and samplers were cleaned by removal of soil adhering to surfaces, and the sampler was then wiped clean with potable water. Borings were backfilled with cuttings from the hole.

5.2 CEC MONITORING WELLS

Borings for the monitoring wells installed at the site were initially drilled using the 3-1/4 inch I.D. hollow-stem augers and 5-foot continuous sampler. Geologic materials were logged and examined as described above. After advancement of the initial boring to the final desired depth, the augers were removed from the hole. The boring was then reamed to 10-inch diameter using 6-1/4 inch I.D. hollow-stem augers. The annular space in the augers was sealed during drilling using a wooden plug that was subsequently knocked out of the augers and left at the bottom of the hole. Well installation then proceeded through the augers due to flowing sands encountered at depth.

Wells were constructed of 4-inch diameter Schedule 40 PVC pipe with 10-foot sections of 0.010 inch machine-slotted screens. Filter packs were composed of clean, well-sorted sand placed to a level approximately 2 feet above the top of the screen. A two-foot bentonite seal was then installed, and the remaining annular space sealed with a neat cement/bentonite slurry. Wells were completed with locking caps and flush-mount protective covers.

Well development was performed using a special surge block that allowed removal of drilling fines from the well bore, as well as creating a surge of water through the screen to loosen and remove fines form the sand pack. Development proceeded until little or no fine materials were produced by the well (typically 30 to 50 well volumes of water).

Immediately following development of the wells, samples of groundwater were collected for laboratory analysis of TCL organics and TAL metals. Samples were collected in a clean PVC bailer and transferred directly to laboratory-supplied bottles.

After completion of the wells, a wellhead survey was performed to determine relative elevations of the wells to within 1/100 of a foot. Static water levels were then measured, allowing determination of groundwater flow directions at the site.

6.0 INVESTIGATION FINDINGS

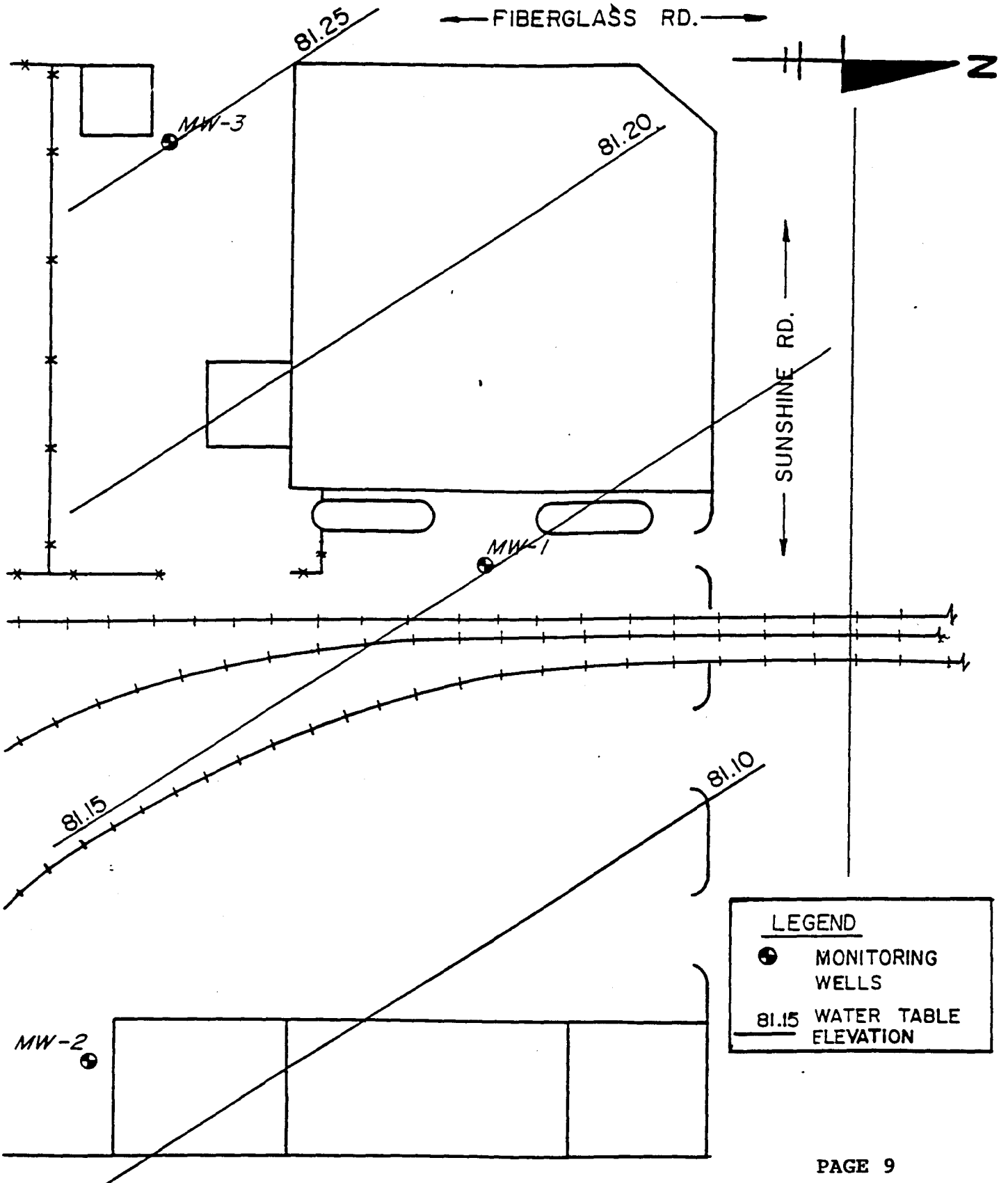
6.1 TITLE SEARCH

CEC initiated a title search of the property at Wyandotte County offices. However, due to complicated historical transactions involving the site, it was decided that CEC would terminate their deed search and,if desired, Ashland would contract a local service to obtain the necessary information. Ashland was informed, and confirmed this decision.

6.2 GROUNDWATER

CEC directed the installation of three monitoring wells on the Olin Water Services site. The boring and well completion logs are included in **Appendix A**. The well locations are depicted in **Figure 1**. Based on wellhead elevations and measurement of static water levels, groundwater flow was found to be directed toward the northeast **(Figure 2)**.

Complete copies of the laboratory results of analysis of volatile organic compounds (VOC's), semi-volatile organic compounds, PCB's, pesticides, and dissolved metals for the groundwater samples collected from the three monitoring wells are included in **(Appendix B)**. PCB's, pesticides, and semi-volatile organic results are all below method detection limits. VOC results are also all below method detection limits with the exceptions of trichloroethylene (TCE) and 1,2-dichloroethylene (1,2-DCE). TCE was detected in all three monitor wells at concentrations ranging between 5.9 and 34 ug/L and 1,2-DCE was detected in only one well, MW-2, at a concentration of 23 ug/L. Dissolved metals concentrations are in the range of background values presented in literature sources.



NOTE: ELEVATION BASED ON RELATIVE PLANT DATUM.

FIGURE 2

Civil & Environmental Consultants, Inc.

DATE: 12/1/89	APPROVED BY:	DWN. BY: M.T.M
SCALE: N T S		CHKD. BY:
WATER TABLE CONTOUR MAP OLIN WATER SERVICES KANSAS CITY, KS		SHEET 1 OF 1
		DRAWING NUMBER 89208-A

6.3 SOILS

Positive volatile organic results for soil samples collected at the site are summarized in **Table 1**. **Table 2** presents positive semi-volatile organic results, and **Table 3** presents metals results. Copies of the soil boring logs, including HNu results, are included in **Appendix A**. Copies of the complete analytical results are included in **Appendix B**.

6.3.1 Borings SB-1 through SB-4 and SB-10 through SB-12

Soil borings SB-1 through SB-4 were intended to investigate near-surface soils in the vicinity of the two aboveground tanks. Borings locations are shown in **Figure 1**. As described in Section 5.1, soil samples collected were logged in the field and scanned for organic vapors using the HNu. Readings of up to 25 ppm were indicated by the HNu, prompting the advancement of additional borings SB-10 through SB-12. Borings SB-10 through SB-12 were advanced in an effort to better define the lateral and vertical extent of potentially impacted soils in the vicinity of the cyclohexlamine storage tank. In addition to the soil borings, a surface soil sample was collected from an area of visible staining located between the railroad tracks **(see Figure 1)**.

6.3.2 Borings SB-5 through SB-9

Soil borings SB-5 through SB-9 were intended to investigate the possibility of impacted near surface soils in the general areas of the property which are presently paved. Borings were completed approximately four feet deep. If no obvious signs of impacted soils were detected in these borings, no soil samples were to be submitted to the laboratory for analysis. Only SB-5, which indicated organic vapors of 3 ppm with the NHu, was sampled and analyzed for TCL volatile organics.

TABLE 1
SOIL SAMPLE VOLATILE ORGANIC RESULTS
(ug/kg)

Boring: / Sample Depth (feet):	SB-1 1.5-4.0	SB-2 1.5-4.0	SB-5 1.5-4.0	SB-10 1.5-3.5	SB-11 1.5-3.5	RR Surface
Toluene	9.4	6.6	ND	ND	ND	35
Tetrachloroethylene	ND	17	ND	ND	ND	ND
Ethylbenzene	5.7	ND	ND	ND	ND	ND
Xylene	12	ND	ND	2,700	ND	16
Trichloroethylene (TCE)	ND	ND	58	ND	ND	ND
1,2-dichlorobenzene	ND	ND	ND	9,300	5,900	ND
1,4-dichlorobenzene	ND	ND	ND	1,700	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND	8
Benzene	ND	ND	ND	ND	ND	7

*Positive results only.

TABLE 2*
SOIL SAMPLE SEMI-VOLATILE ORGANIC RESULTS
(ug/kg)

Boring: / Sample Depth (feet):	SB-1 1.5-4.0	SB-2 1.5-4.0	SB-3 1.5-4.0	SB-4 1.5-4.0	SB-10 1.5-3.5	SB-10 5.0-7.0	SB-10 7.0-9.0	SB-11 1.5-3.5	RR Surface	Normal Background Concentrations**
Pyrene	ND	ND	ND	ND	2,100	ND	ND	ND	9,100	100
Naphthalene	ND	ND	ND	ND	520	ND	ND	ND	ND	--
Pentachlorophenol	ND	ND	ND	ND	22,000	ND	ND	ND	ND	--
Phenanthrene	ND	ND	ND	ND	930	ND	ND	ND	ND	--
Fluoranthrene	ND	ND	ND	ND	1,900	ND	ND	ND	ND	5 - 120
Benzo(a)anthracene[1]	ND	ND	ND	ND	1,300	ND	ND	ND	ND	20
Chrysene[1]	ND	ND	ND	ND	1,500	ND	ND	ND	ND	20
Benzo(b)fluoranthrene[1]	ND	ND	ND	ND	2,200	ND	ND	ND	ND	10
Benzo(k)fluoranthrene[1]	ND	ND	ND	ND	1,100	ND	ND	ND	ND	--
Benzo(a)pyrene[1]	ND	ND	ND	ND	1,600	ND	ND	ND	ND	50 - 75
Indeno(1,2,3-cd)pyrene[1]	ND	ND	ND	ND	1,200	ND	ND	ND	ND	--
Benzo(g,h,i)perylene	ND	ND	ND	ND	1,100	ND	ND	ND	ND	100
1,1,2,2-tetrachloro-ethane	260	280	500	310	ND	460	440	11	ND	--
4-methyl-2,4-pentanediol	2000	390	ND	ND	ND	ND	ND	ND	ND	--
N-methyl-N-nitroso-2-butanamine	690	ND	ND	ND	ND	ND	ND	ND	ND	--
Morpholine	990	270	ND	ND	370	ND	ND	330	ND	--
Cyclohexanone	ND	220	ND	ND	ND	ND	ND	ND	ND	--

Positive results only.
*Reference: International Association for Research on Cancer, 1983

Known or suspected carcinogen

TABLE 3
SOIL SAMPLE METALS RESULTS

Boring: / Sample Depth (feet):	SB-1 1.5-4.0	SB-2 1.5-4.0	SB-3 1.5-4.0	SB-4 1.5-4.0	SB-10 1.5-3.5	SB-11 1.5-3.5	SB-12 1.0-3.0	Normal Background Concentrations**
Aluminum	15000	16000	27000	6800	9300	13000	7900	--
Antimony	<2.5	<2.6	3.1	<2.6	<4.9	<5.6	<5.2	--
Arsenic	20	8.5	17	9.8	3.7	9.6	2.3	6
Barium	210	220	280	210	110	260	88	430
Beryllium	1.2	1.2	1.1	0.87	<0.48	<0.56	<0.52	--
Cadmium	0.69	0.52	1.1	0.37	0.58	1.6	<0.51	0.50
Calcium	16000	14000	20000	33000	33000	11000	3300	--
Chromium	18	18	25	27	14	260	14	100
Cobalt	7.9	7.7	13	6.2	5.1	9.1	4.6	8
Copper	16	14	29	11	10	24	5.9	25
Iron	18000	17000	31000	16000	9700	19000	7200	--
Lead	23	22	36	15	18	33	10	10
Magnesium	7200	7000	7900	5700	3300	6700	1600	--
Manganese	340	1400	1600	460	310	810	190	850
Mercury	0.042	0.034	<0.033	<0.025	0.022	0.046	0.018	0.30
Nickel	17	25	28	13	11	21	9.5	40
Potassium	2200	3300	3800	1300	1600	2800	1000	--
Selenium					<0.97	<1.1	<1.0	0.50
Silver	<1.0	<1.0	<1.2	<1.1	<0.97	<1.1	<1.0	0.05
Sodium	390	370	430	320	940	2400	860	--
Thallium					<0.87	<1.1	<1.0	5
Vanadium	34	44	51	19	19	36	13	--
Zinc	56	72	82	52	46	100	32	50
Soil pH	7.9	7.7	8.1	8.0	9.7	9.1	8.4	

All concentrations in mg/kg on dry weight basis
*Reference: Metals in Soils: A Brief Summary, Office of Toxic Substances, USEPA

7.0 SUMMARY

7.1 GROUNDWATER

Based on wellhead elevations and measured static water levels in the monitoring wells, groundwater flow was found to be from southwest to northeast. Analytical water sample analyses indicate the presence of ppb concentrations of trichloroethylene (TCE) and 1,2-dichloroethylene (1,2-DCE) in wells MW-1, 2 and 3 and MW-2 respectively.

7.2 SOILS

Soils investigations (boring SB-5) indicates the presence of a ppb concentration of TCE in near surface soil below the parking lot south of the manufacturing portion of the facility. Analysis of an additional near surface soil sample, from the area around the aboveground storage tanks east of the building (the 1.5-3.5 foot interval of boring SB-10) indicates the localized presence of several semi-volatile organic components at this location. Neither the deeper soil samples from SB-10, nor similar depth samples from borings SB-1, 2 and 11 detected the same semi-volative organic compounds. 1, 1,2 , 2-tetrachloroethane was an exception in the above ground tank area, as it was detected in a number of the borings and at varying depths. Common fuel constituents; benzene, toluene, xylene, and ethylbenzene, were also detected at several near surface boring locations. In addition, dichlorobenzene was found in two of the borings.

Ashland Chemical

Environmental, Health & Safety
G. W. Hammer
Director
(614) 889-3052

Ashland Chemical, Inc.
Subsidiary of
Ashland Oil, Inc.

Address
P.O. Box 2219
Columbus, Ohio 43216

September 19, 1991

Lyndell L. Harrington, P.E.
Chief, Permit Section, RCRA Branch
U.S. EPA
Region VII
726 Minnesota Avenue
Kansas City, Kansas 66101

RE: EPA ID No. KSD000203638
Kansas City, Kansas Facility
Information Request

Dear Mr. Harrington:

Per your letter dated August 16, 1991, and received August 20, 1991 Drew Chemical, a Division of Ashland Chemical, Inc. submits the included information.

1. A final report of analytical data which was collected at the above facility during a pre-acquisition investigation. A draft report of a follow up investigation is not in final copy at this time. Please notify me if the agency requires that report also.

2. The alleged spill incident occurred on July 29, 1986, not July 29, 1990. During a routine inspection by the Kansas Department of Health and Environment on July 29, 1986 staining was noted on the sides of the VSR Sump Vat, but no material was being released at that time. The staining was a result of previous overflows of small unmeasurable quantities, which merely wetted the sides of the sump vat. Dates of the prior events are unknown.

If you have questions or need additional information please contact me at 614-889-3065.

Very truly yours,

William C. Olasin

William C. Olasin
Environmental Engineer

Headquarters
5200 Blazer Parkway
Dublin, Ohio 43017

Cable Address: Aroplaz OH
Telex: 245385
Answerback: ASHCHEM
Fax: (614) 889-3461
(614) 889-4250

APPENDIX A

BORING AND WELL COMPLETION LOGS

SOIL BORING LOGS

Boring Number			HNu Readings
SB-1	0-1 ft.	Crushed stone	
	1-4 ft.	Black clayey silt, damp	12 ppm in hole
SB-2	0-1 ft.	Crushed stone	
	1-4 ft.	Dark gray clayey silt, dry to damp	25 ppm in hole
SB-3	0-1 ft.	Crushed stone	
	1-4 ft.	Dark gray and brown clayey silt, trace organics, dry to damp	1 ppm in hole
SB-4	0-1 ft.	Crushed stone	
	1-4 ft.	Dark gray silt, some fine sand near bottom, dry to damp	0 ppm in hole
SB-5	0-10 in.	Asphalt	
	1-4 ft.	Black silt, some wood and coal fragments, fine sand at bottom	3 ppm in hole
SB-6	0-1 ft.	Asphalt	
	1-4 ft.	Brown and black silt, brown sand at bottom, dry to damp	0 ppm in hole
SB-7	0-1 ft.	Asphalt	
	1-4 ft.	Dark gray silt, some wood fragments, dry to damp	0 ppm in hole
SB-8	0-1 ft.	Asphalt	
	1-4 ft.	Dark gray silt, dry to damp	0 ppm in hole
SB-9	0-1 ft.	Asphalt	
	1-4 ft.	Black silt with red brick fragments, brown silt, damp	0 ppm in hole
SB-10	0-1.5 ft.	Crushed stone	
	1.5-3.5 ft.	Dark gray silt, dry to damp	4 ppm on sample
	5-7 ft.	Gray-brown silt, moist	2 ppm on sample
	7-9 ft.	Gray-brown silt, moist	1 ppm on sample
SB-11	0-1.5 ft.	Crushed stone	
	1.5-3.5 ft.	Gray silt, black oily layer at 2.5 ft.	8 ppm on sample
SB-12	0-1 ft.	Crushed stone	
	1-3 ft.	Brown silt, dry to damp	0 ppm on sample
	5-7 ft.	Brown silt, damp	0 ppm on sample

Civil & Environmental Consultants, Inc.

PROJECT Ashland / Olin — PROJECT NO. 89208
ELEVATION _____ GWL 0 HRS. _____ HRS. — BORING NO. MW-1
DATE 11/20/89 FIELD ENGINEER M Knuth — PAGE NO. 1 OF _____

DEPTH FEET	BLOWS PER SIX INCHES OR CORE RECOVERY/RUN	SAMPLE NO. TYPE & SPOON RECOVERY OR % ROCK RECOVERY	CASING BLOWS	DESCRIPTION: PROFILE	DESCRIPTION: SOIL DENSITY-CONSISTENCY OR ROCK HARDNESS	DESCRIPTION: COLOR	DESCRIPTION: MATERIAL CLASSIFICATION	USCS OR ROCK BROKENESS	REMARKS
1	2	3	4	5	6	7	8	9	10
1							Railroad Ballast		
2				S-1		Dk gray	silt, some wood chips, damp		0 ppm
3									
4									
5									
6				S-2		Dk gray	clayey silt, trace pebbles moist		0 ppm
7							some wet layers evidence of		
8							wet fractures vy porous		
9									
10				S-3		Dk gray	clayey silt, some wet layers		
11									0 ppm
12									
13						Dk gray	brown vy well sorted fine sand		
14							moist to wet · dotness contact		
15							@ 12.5 ft		
16				S-4					
17						Lt brown	vy well sorted fine sand dry		0 ppm
18							to damp Auger		
19									
20									
21				S-5		Dk gray	vy well sorted fine sand.		0 ppm
22							wet loose		Sand blowing in
23									augers 1.5
24									
25									
26				S-6					
27									
28									
29									
30									

REMARKS: Sampled using CME 5 ft continous sampler w/ 3 ¼ ID augers
Grout - bags Bentonite - 2 buckets cement - bags

PROJECT NO. _____
BORING NO.: MW-1

* POCKET PENETROMETER READINGS

screen 30.20
30.17

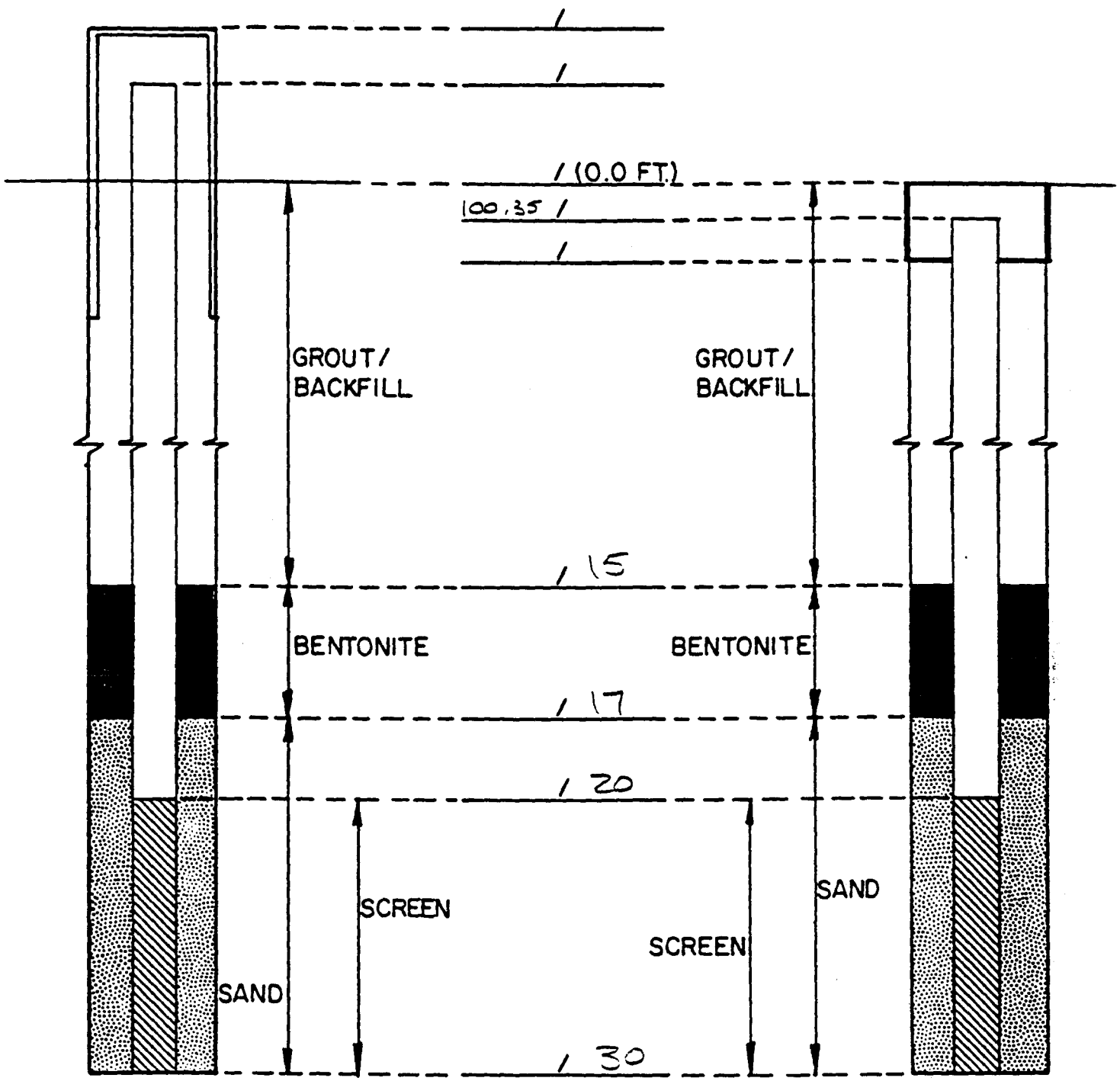
Civil & Environmental Consultants, Inc.

PROJECT NAME: Ashland / Olin PROJECT NO.: 89208

WELL NO.: MW-1 DATE: _____ LOCATION: Kansas City, Ks.

DRILLING METHOD: H.S.A. GEOLOGIST: M Knuth

ELEVATION / DEPTH



NOTES: survey elevations using relative datum

Civil & Environmental Consultants, Inc.

PROJECT Ashland/Olin — PROJECT NO. 89208

ELEVATION _____ GWL 0 HRS. _____ BORING NO. MW-2

DATE 11/21 FIELD ENGINEER M Kruth — PAGE NO. 1 OF _____

DEPTH FEET	BLOWS PER SIX INCHES OR CORE RECOVERY; RUN	SAMPLE NO. TYPE & SPOON RECOVERY OR % ROCK RECOVERY	CASING BLOWS	DESCRIPTION: PROFILE	SOIL DENSITY-CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENESS	REMARK
1	2	3	4	5	6	7	8	9	10
1							Asphalt		
2									
3				S-1		Dk brn & black	silt, trace sand & small		0 ppm
4							pebbles damp		
5									
6				S-2		Brown	clayey silt damp trace organic		0 ppm
7							matl.		
8									
9									
10						Brown	clayey silt damp to 10ft		0 ppm
11									
12				S-3		Brown	well sorted fine sand dry		0 ppm
13							loose		
14									
15									
16				S-4		Brown	w well sorted fine sand dry		
17									0 ppm
18							16-16.5 ft grey clay lens moist		
19									
20									
21				S-5		Brown	w well sorted fine-med sand		
22							sat'd		
23									
24									
25									
26									
27									
28									
29									
30									

REMARKS: screen 30'-20' sand 30'-18' bent 18'-15'

16 hours 12 pm.le

PROJECT NO. _____

BORING NO. _____

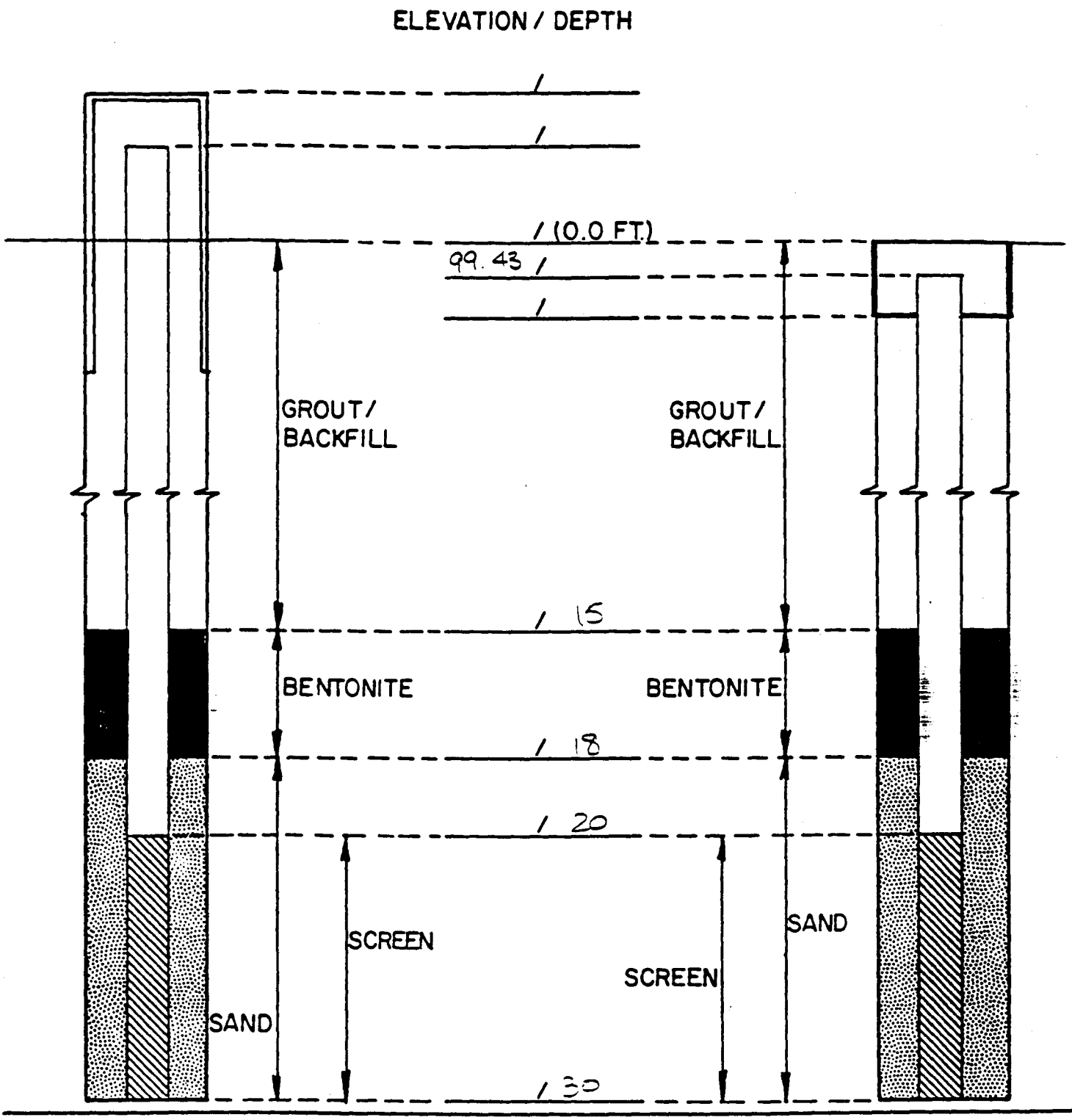
* POCKET PENETROMETER READINGS

Civil & Environmental Consultants, Inc.

PROJECT NAME: Ashland/Olin PROJECT NO.: 8920

WELL NO.: MW-2 DATE: _____ LOCATION: Kansas City, Ks.

DRILLING METHOD: +SA GEOLOGIST: M. Kuth



NOTES: Survey elevations using relative datum

Civil & Environmental Consultants, Inc.

PROJECT Ashland/Olin — PROJECT NO. 2[illegible]8

ELEVATION _____ GWL 0 HRS. _____ HRS. — BORING NO. MW-3

DATE 11/27 — FIELD ENGINEER M Kajfa — PAGE NO. 1 OF _____

DEPTH FEET	BLOWS PER SIX INCHES OR CORE RECOVERY; RUN	SAMPLE NO. TYPE & SPOON RECOVERY OR % ROCK RECOVERY	CASING BLOWS	DESCRIPTION: PROFILE	SOIL DENSITY-CONSISTENCY OR ROCK HARDNESS	COLOR	MATERIAL CLASSIFICATION	USCS OR ROCK BROKENESS	REMARKS
1	2	3	4	5	6	7	8	9	10
1							Asphalt ~1 ft thick		
2									
3				S-1		Grey &	Brown silt, some sand, moist		0 ppm
4									
5									
6						Brown	silt, trace fine over sand, damp		0 ppm
7				S-2					
8									
9									
10									
11						Brown	silt, damp brown sand at tip		poor recovery
12				S-3			of sampler		
13									
14									
15									
16						Brown	vy well sorted fine sand, dry		poor recovery
17				S-4					
18									
19									
20									
				S-5		Brown	fine to med vy well sorted sand, sat		
25									
30									

REMARKS: screen 29-14 sand 29-17 bent 17-14 cement 7 bags

60 sacks 62 sacks

PROJECT NO. _____

BORING NO.: _____

* POCKET PENETROMETER READINGS

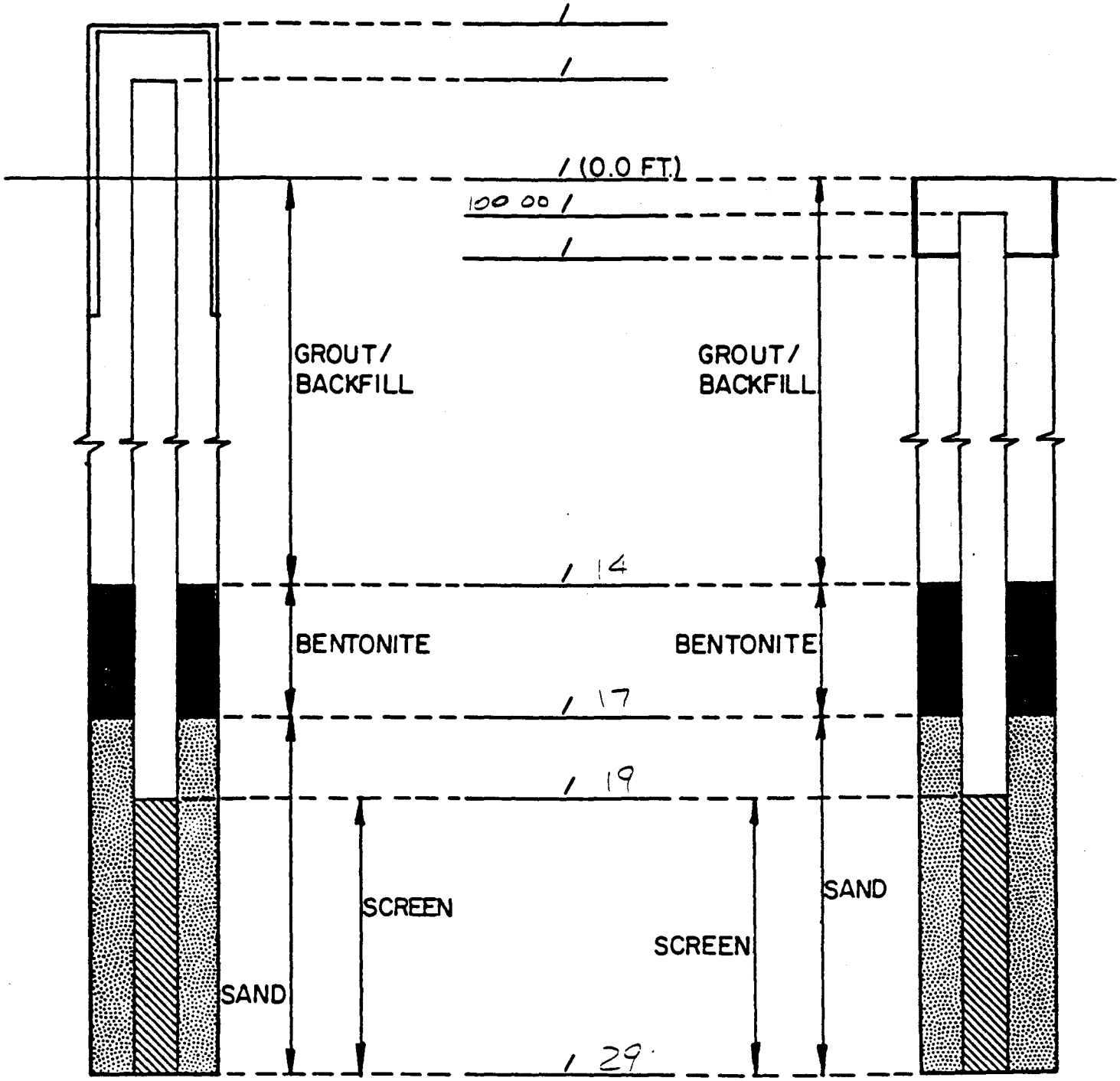
Civil & Environmental Consultants, Inc.

PROJECT NAME: Ashland/Olin PROJECT NO.: 89208

WELL NO.: MW-3 DATE: _____ LOCATION: Kansas City, Ks.

DRILLING METHOD: H.S.A. GEOLOGIST: M Kath

ELEVATION / DEPTH



NOTES: Survey elevations using relative datum

APPENDIX B

ANALYTICAL RESULTS

James W. Andrews, Ph.D.
President

Janette Davis Long
Vice-President

SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue (31404)
P. O. Box 13548 • Savannah, GA 31416-0548
(912) 354-7858

LOG NO: 89-10141

Received: 22 NOV 89

Mr. Marty Knuth
Civil & Env. Consultants Inc.
790 Holiday Drive
Pittsburgh, PA 15220

Project: 89208/Olin, KC

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10141-1	SB-1 (11-21-89)	Client
10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Aluminum, mg/kg dw	15000	6500	27000	6800
Antimony, mg/kg dw	<2.5	<2.6	3.1	<2.6
Arsenic, mg/kg dw	20	8.5	17	9.8
Barium, mg/kg dw	210	220	280	210
Beryllium, mg/kg dw	1.2	1.2	1.1	0.87
Cadmium, mg/kg dw	0.69	0.52	1.1	0.37
Calcium, mg/kg dw	16000	14000	20000	33000
Chromium, mg/kg dw	18	18	25	27
Cobalt, mg/kg dw	7.9	7.7	13	6.2
Copper, mg/kg dw	16	14	29	11
Iron, mg/kg dw	18000	17000	31000	16000
Lead, mg/l	23	22	36	15
Magnesium, mg/kg dw	7200	7000	7900	5700
Manganese, mg/kg dw	340	1400	1600	460
Mercury, mg/kg dw	0.042	0.034	<0.033	<0.025
Nickel, mg/kg dw	17	25	28	13
Potassium, mg/kg dw	2200	3300	3800	1300
Selenium, mg/kg dw	<1.0	<0.98	<1.1	<1.0
Silver, mg/kg dw	<1.0	<1.0	<1.2	<1.1
Sodium, mg/kg dw	390	370	430	320

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Janette Davis Long
Vice-President

SAVANNAH LABORATORIES
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(912) 354-7858

LOG NO: 89-10141

Received: 22 NOV 89

Mr. Marty Knuth
Civil & Env. Consultants Inc.
790 Holiday Drive
Pittsburgh, PA 15220

Project: 89208/Olin, KC

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10141-1	SB-1 (11-21-89)	Client
10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER		10141-1	10141-2	10141-3	10141-4
Thallium, mg/kg dw		<1.0	<0.98	<1.1	<1.0
Vanadium, mg/kg dw		34	44	51	19
Zinc, mg/kg dw		56	72	82	52
Cyanide, mg/kg dw		<1.2	<1.2	<1.3	<1.2

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Trans-1,3-Dichloropropene, ug/kg dw	<5	<5	<5	<5
Trichloroethylene, ug/kg dw	<5	<5	<5	<5
Dibromochloromethane, ug/kg dw	<5	<5	<5	<5
1,1,2-Trichloroethane, ug/kg dw	<5	<5	<5	<5
Benzene, ug/kg dw	<5	<5	<5	<5
Cis-1,3-Dichloropropene, ug/kg dw	<5	<5	<5	<5
Bromoform, ug/kg dw	<5	<5	<5	<5
2-Hexanone, ug/kg dw	<10	<10	<10	<10
4-methyl-2-pentanone, ug/kg dw	<10	<10	<10	<10
Tetrachloroethylene, ug/kg dw	<5	17	<5	<5
Toluene, ug/kg dw	9.4	6.6	<5	<5
Chlorobenzene, ug/kg dw	<5	<5	<5	<5
Ethylbenzene, ug/kg dw	5.7	<5	<5	<5
Styrene, ug/kg dw	<5	<5	<5	<5
Xylenes, ug/kg dw	12	<5	<5	<5

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
TCL Semivolatiles				
Phenol, ug/kg dw	<470	<470	<470	<470
bis(2-Chloroethyl) ether, ug/kg dw	<470	<470	<470	<470
2-Chlorophenol, ug/kg dw	<470	<470	<470	<470
1,3-Dichlorobenzene, ug/kg dw	<470	<470	<470	<470
1,4-Dichlorobenzene, ug/kg dw	<470	<470	<470	<470
Benzyl alcohol, ug/kg dw	<940	<940	<940	<940
1,2-Dichlorobenzene, ug/kg dw	<470	<470	<470	<470
2-Methylphenol (o-cresol), ug/kg dw	<470	<470	<470	<470
bis(2-Chloro-1-methylethyl) ether, ug/kg dw	<470	<470	<470	<470
4-Methylphenol (p-cresol), ug/kg dw	<470	<470	<470	<470
N-Nitroso-di-n-dipropylamine, ug/kg dw	<470	<470	<470	<470
Hexachloroethane, ug/kg dw	<470	<470	<470	<470
Nitrobenzene, ug/kg dw	<470	<470	<470	<470
Isophorone, ug/kg dw	<470	<470	<470	<470
2-Nitrophenol, ug/kg dw	<470	<470	<470	<470
2,4-Dimethylphenol, ug/kg dw	<470	<470	<470	<470
Benzoic acid, ug/kg dw	<2400	<2400	<2400	<2400
bis(2-Chloroethoxy) methane, ug/kg dw	<470	<470	<470	<470
2,4-Dichlorophenol, ug/kg dw	<470	<470	<470	<470

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10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
1,2,4-Trichlorobenzene, ug/kg dw	<470	<470	<470	<470
Naphthalene, ug/kg dw	<470	<470	<470	<470
4-Chloroaniline, ug/kg dw	<940	<940	<940	<940
Hexachlorobutadiene, ug/kg dw	<470	<470	<470	<470
4-Chloro-3-methylphenol, ug/kg dw	<470	<470	<470	<470
2-Methylnaphthalene, ug/kg dw	<470	<470	<470	<470
Hexachlorocyclopentadiene, ug/kg dw	<470	<470	<470	<470
2,4,6-Trichlorophenol, ug/kg dw	<470	<470	<470	<470
2,4,5-Trichlorophenol, ug/kg dw	<470	<470	<470	<470
2-Chloronaphthalene, ug/kg dw	<470	<470	<470	<470
2-Nitroaniline, ug/kg dw	<2400	<2400	<2400	<2400
Dimethylphthalate, ug/kg dw	<470	<470	<470	<470
Acenaphthylene, ug/kg dw	<470	<470	<470	<470
3-Nitroaniline, ug/kg dw	<2400	<2400	<2400	<2400
Acenaphthene, ug/kg dw	<470	<470	<470	<470
2,4-Dinitrophenol, ug/kg dw	<2400	<2400	<2400	<2400
4-Nitrophenol, ug/kg dw	<2400	<2400	<2400	<2400
Dibenzofuran, ug/kg dw	<470	<470	<470	<470
2,4-Dinitrotoluene, ug/kg dw	<470	<470	<470	<470
2,6-Dinitrotoluene, ug/kg dw	<470	<470	<470	<470

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Volatiles by GC/MS				
Chloromethane, ug/kg dw	<10	<10	<10	<10
Bromomethane, ug/kg dw	<10	<10	<10	<10
Vinyl Chloride, ug/kg dw	<10	<10	<10	<10
Chloroethane, ug/kg dw	<10	<10	<10	<10
Methylene Chloride, ug/kg dw	<5	<5	<5	<5
Acetone, ug/kg dw	<25	<25	<25	<25
Carbon Disulfide, ug/kg dw	<5	<5	<5	<5
1,1-Dichloroethylene, ug/kg dw	<5	<5	<5	<5
1,1-Dichloroethane, ug/kg dw	<5	<5	<5	<5
1,2-Dichloroethene, ug/kg dw	<5	<5	<5	<5
Chloroform, ug/kg dw	<5	<5	<5	<5
1,2-Dichloroethane, ug/kg dw	<5	<5	<5	<5
2-Butanone, ug/kg dw	<10	<10	<10	<10
1,1,1-Trichloroethane, ug/kg dw	<5	<5	<5	<5
Carbon Tetrachloride, ug/kg dw	<5	<5	<5	<5
Vinyl Acetate, ug/kg dw	<10	<10	<10	<10
Bromodichloromethane, ug/kg dw	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane, ug/kg dw	<5	<5	<5	<5
1,2-Dichloropropane, ug/kg dw	<5	<5	<5	<5

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Diethylphthalate, ug/kg dw	<470	<470	<470	<470
4-Chlorophenyl-phenyl ether, ug/kg dw	<470	<470	<470	<470
Fluorene, ug/kg dw	<470	<470	<470	<470
4-Nitroaniline, ug/kg dw	<2400	<2400	<2400	<2400
4,6-Dinitro-2-methylphenol, ug/kg dw	<2400	<2400	<2400	<2400
N-Nitrosodiphenylamine/diphenylamine, ug/kg dw	<470	<470	<470	<470
4-Bromophenyl-phenyl-ether, ug/kg dw	<470	<470	<470	<470
Hexachlorobenzene, ug/kg dw	<470	<470	<470	<470
Pentachlorophenol, ug/kg dw	<2400	<2400	<2400	<2400
Phenanthrene, ug/kg dw	<470	<470	<470	<470
Anthracene, ug/kg dw	<470	<470	<470	<470
Di-n-butylphthalate, ug/kg dw	<470	<470	<470	<470
Fluoranthene, ug/kg dw	<470	<470	<470	<470
Pyrene, ug/kg dw	<470	<470	<470	<470
Butylbenzylphthalate, ug/kg dw	<470	<470	<470	<470
3,3'-Dichlorobenzidine, ug/kg dw	<940	<940	<940	<940
Benzo(a)anthracene, ug/kg dw	<470	<470	<470	<470
bis(2-Ethylhexyl) phthalate, ug/kg dw	<470	<470	<470	<470
Chrysene, ug/kg dw	<470	<470	<470	<470

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Di-n-octylphthalate, ug/kg dw	<470	<470	<470	<470
Benzo(b)fluoranthene, ug/kg dw	<470	<470	<470	<470
Benzo(k)fluoranthene, ug/kg dw	<470	<470	<470	<470
Benzo(a)pyrene, ug/kg dw	<470	<470	<470	<470
Indeno (1,2,3-cd)pyrene, ug/kg dw	<470	<470	<470	<470
Dibenzo (a,h)anthracene, ug/kg dw	<470	<470	<470	<470
Benzo(g,h,i)perylene, ug/kg dw	<470	<470	<470	<470

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
TCL Pesticides				
alpha-BHC, ug/kg dw	<2.5	<2.5	<2.8	<2.5
beta-BHC, ug/kg dw	<2.5	<2.5	<2.8	<2.5
delta-BHC, ug/kg dw	<2.5	<2.5	<2.8	<2.5
gamma-BHC, ug/kg dw	<2.5	<2.5	<2.8	<2.5
Heptachlor, ug/kg dw	<2.5	<2.5	<2.8	<2.5
Aldrin, ug/kg dw	<2.5	<2.5	<2.8	<2.5
Heptachlor epoxide, ug/kg dw	<4.9	<5.0	<5.6	<5.1
Endosulfan I, ug/kg dw	<4.9	<5.0	<5.6	<5.1
Dieldrin, ug/kg dw	<4.9	<5.0	<5.6	<5.1
4,4'-DDE, ug/kg dw	<4.9	<5.0	<5.6	<5.1
Endrin, ug/kg dw	<4.9	<5.0	<5.6	<5.1
Endosulfan II, ug/kg dw	<12	<13	<14	<13
4,4'-DDD, ug/kg dw	<4.9	<5.0	<5.6	<5.1
Endosulfan sulfate, ug/kg dw	<20	<20	<23	<20
4,4'-DDT, ug/kg dw	<12	<13	<14	<13
Endrin ketone, ug/kg dw	<20	<20	<23	<20
Methoxychlor, ug/kg dw	<99	<100	<110	<100
alpha-Chlordane, ug/kg dw	<2.5	<2.5	<2.8	<2.5
gamma-Chlordane, ug/kg dw	<2.5	<2.5	<2.8	<2.5

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10141-2	SB-2 (11-21-89)	
10141-3	SB-3 (11-21-89)	
10141-4	SB-4 (11-21-89)	

PARAMETER	10141-1	10141-2	10141-3	10141-4
Toxaphene, ug/kg dw	<200	<200	<230	<200
Aroclor-1016, ug/kg dw	<99	<100	<110	<100
Aroclor-1221, ug/kg dw	<99	<100	<110	<100
Aroclor-1232, ug/kg dw	<99	<100	<110	<100
Aroclor-1242, ug/kg dw	<99	<100	<110	<100
Aroclor-1248, ug/kg dw	<99	<100	<110	<100
Aroclor-1254, ug/kg dw	<99	<100	<110	<100
Aroclor-1260, ug/kg dw	<99	<100	<110	<100
NBS Library Search, ID	*	*	*	*
pH, units	7.9	7.7	8.1	8.0
Percent Solids, %	81 %	80 %	71 %	79 %
Cyclohexylamine, ug/kg dw	<1900	<1900	<1900	<1900

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10141-5	SB-5 (11-21-89)	Client

PARAMETER	10141-5
Volatiles by GC/MS	
Chloromethane, ug/kg	<10
Bromomethane, ug/kg	<10
Vinyl Chloride, ug/kg	<10
Chloroethane, ug/kg	<10
Methylene Chloride, ug/kg	<5
Acetone, ug/kg	<25
Carbon Disulfide, ug/kg	<5
1,1-Dichloroethylene, ug/kg	<5
1,1-Dichloroethane, ug/kg	<5
1,2-Dichloroethene, ug/kg	<5
Chloroform, ug/kg	<5
1,2-Dichloroethane, ug/kg	<5
2-Butanone, ug/kg	<10
1,1,1-Trichloroethane, ug/kg	<5
Carbon Tetrachloride, ug/kg	<5
Vinyl Acetate, ug/kg	<10
Bromodichloromethane, ug/kg	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5
1,2-Dichloropropane, ug/kg	<5
Trans-1,3-Dichloropropene, ug/kg	<5
Trichloroethylene, ug/kg	58
Dibromochloromethane, ug/kg	<5

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10141-5	SB-5 (11-21-89)	Client

PARAMETER	10141-5
1,1,2-Trichloroethane, ug/kg	<5
Benzene, ug/kg	<5
Cis-1,3-Dichloropropene, ug/kg	<5
Bromoform, ug/kg	<5
2-Hexanone, ug/kg	<10
4-methyl-2-pentanone, ug/kg	<10
Tetrachloroethylene, ug/kg	<5
Toluene, ug/kg	<5
Chlorobenzene, ug/kg	<5
Ethylbenzene, ug/kg	<5
Styrene, ug/kg	<5
Xylenes, ug/kg	<5

Methods: SW-846.

Steven J. White

Steven J. White

Case No: 1128A08A

Sample Number: 10141 SB-1

Organics Analysis Data Sheet

30.80g 81%
FV = 1.0

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	79345	Ethane, 1,1,2,2-tetrachloro-	BN/A	6.678	260
2.	107415	2,4-Pentane diol, 2-methyl	BN/A	7.484	2000
3.	35606372	2-Butanamine, N-methyl-N-nitroso-	BN/A	11.524	690
4.	1696204	Morpholine, 4-acetyl	BN/A	12.660	990
5.		Unknown	BN/A	14.101	180
6.		Unknown	BN/A	14.485	370
7.	10544500	Sulfur, mol.	BN/A	23.084	1600
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Laboratory Name: Savannah Division

Case No: 1128A09A

Sample Number
10141-SB2

30.35g
FV 1.0
8090

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)*
1.	100743	Morpholine, 4-ethyl	BN/A	5.613	270
2.	1008941	Cyclohexanone	BN/A	5.955	220
3.	79345	Ethane, 1,1,2,2-tetrachloro-	BN/A	6.696	280
4.		Unknown	BN/A	7.196	580
5.	107415	2,4-Pentanediol, 2-methyl	BN/A	7.448	390
6.		Unknown	BN/A	11.543	690
7.		Unknown	BN/A	13.128	3200
8.	10544500	Sulfur, mol.	BN/A	20.448	310
9.	10544500	Sulfur, mol.	BN/A	23.116	3500
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Case No: 1128A10A

10141 SB-3

30.23g 71%
FV = 1.0

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	(RT) or Scan Number	Estimated Concentration (ug/l or (ug/kg))
1.	79345	Ethane, 1,1,2,2-tetrachloro	BN/A	6.667	500
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

James W. Andrews, Ph.D.
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Janette Davis Long
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SAVANNAH LABORATORIES AND ENVIRONMENTAL SERVICES, INC.

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LOG NO: 89-10360

Received: 30 NOV 89

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Civil & Env. Consultants Inc.
790 Holiday Drive
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Project: 89204

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 1.5-3.5' (11.28.89)	Client
10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Aluminum, mg/kg dw	9300	13000	7900
Antimony, mg/kg dw	<4.9	<5.6	<5.2
Arsenic, mg/kg dw	3.7	9.6	2.3
Barium, mg/kg dw	110	260	88
Beryllium, mg/kg dw	<0.48	<0.56	<0.52
Cadmium, mg/kg dw	0.58	1.6	<0.51
Calcium, mg/kg dw	33000	11000	3300
Chromium, mg/kg dw	14	260	14
Cobalt, mg/kg dw	5.1	9.1	4.6
Copper, mg/kg dw	10	24	5.9
Iron, mg/kg dw	9700	19000	7200
Lead, mg/kg dw	18	33	10
Magnesium, mg/kg dw	3300	6700	1600
Manganese, mg/kg dw	310	810	190
Mercury, mg/kg dw	0.022	0.046	0.018
Nickel, mg/kg dw	11	21	9.5
Potassium, mg/kg dw	1600	2800	1000
Selenium, mg/kg dw	<0.97	<1.1	<1.0
Silver, mg/kg dw	<0.97	<1.1	<1.0
Sodium, mg/kg dw	940	2400	860
Thallium, mg/kg dw	<0.87	<1.1	<1.0

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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Vanadium, mg/kg dw	19	36	13
Zinc, mg/kg dw	46	100	32
Cyanide, mg/kg dw	<1.0	<1.2	<1.1

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 1.5-3.5' (11.28.89)	Client
10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Volatiles by GC/MS			
Chloromethane, ug/kg	<1000	<1000	<10
Bromomethane, ug/kg	<1000	<1000	<10
Vinyl Chloride, ug/kg	<1000	<1000	<10
Chloroethane, ug/kg	<1000	<1000	<10
Methylene Chloride, ug/kg	<500	<500	<5
Acetone, ug/kg	<2500	<2500	<25
Carbon Disulfide, ug/kg	<500	<500	<5
1,1-Dichloroethylene, ug/kg	<500	<500	<5
1,1-Dichloroethane, ug/kg	<500	<500	<5
1,2-Dichloroethene, ug/kg	<500	<500	<5
Chloroform, ug/kg	<500	<500	<5
1,2-Dichloroethane, ug/kg	<500	<500	<5
2-Butanone, ug/kg	<1000	<1000	<10
1,1,1-Trichloroethane, ug/kg	<500	<500	<5
Carbon Tetrachloride, ug/kg	<500	<500	<5
Vinyl Acetate, ug/kg	<1000	<1000	<10
Bromodichloromethane, ug/kg	<500	<500	<5
1,1,2,2-Tetrachloroethane, ug/kg	<500	<500	<5
1,2-Dichloropropane, ug/kg	<500	<500	<5
Trans-1,3-Dichloropropene, ug/kg	<500	<500	<5

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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Trichlorcethylene, ug/kg	<500	<500	<5
Dibromochloromethane, ug/kg	<500	<500	<5
1,1,2-Trichloroethane, ug/kg	<500	<500	<5
Benzene, ug/kg	<500	<500	<5
Cis-1,3-Dichloropropene, ug/kg	<500	<500	<5
Bromoform, ug/kg	<500	<500	<5
2-Hexanone, ug/kg	<1000	<1000	<10
4-methyl-2-pentanone, ug/kg	<1000	<1000	<10
Tetrachloroethylene, ug/kg	<500	<500	<5
Toluene, ug/kg	<500	<500	<5
Chlorobenzene, ug/kg	<500	<500	<5
Ethylbenzene, ug/kg	<500	<500	<5
Styrene, ug/kg	<500	<500	<5
Xylenes, ug/kg	2700	<500	<5
Additional Compounds:			
1,2 Dichlorobenzene, ug/kg	9300	5900	—
1,3 Dichlorobenzene, ug/kg	<500	<500	—
1,4 Dichlorobenzene, ug/kg	1700	<500	—

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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
TCL Semivolatiles			
Phenol, ug/kg dw	<350	<430	<380
bis(2-Chloroethyl) ether, ug/kg dw	<350	<430	<380
2-Chlorophenol, ug/kg dw	<350	<430	<380
1,3-Dichlorobenzene, ug/kg dw	<350	<430	<380
1,4-Dichlorobenzene, ug/kg dw	<350	<430	<380
Benzyl alcohol, ug/kg dw	<700	<850	<750
1,2-Dichlorobenzene, ug/kg dw	<350	<430	<380
2-Methylphenol (o-cresol), ug/kg dw	<350	<430	<380
bis(2-Chloro-1-methylethyl) ether, ug/kg dw	<350	<430	<380
4-Methylphenol (p-cresol), ug/kg dw	<350	<430	<380
N-Nitroso-di-n-dipropylamine, ug/kg dw	<350	<430	<380
Hexachloroethane, ug/kg dw	<350	<430	<380
Nitrobenzene, ug/kg dw	<350	<430	<380
Isophorone, ug/kg dw	<350	<430	<380
2-Nitrophenol, ug/kg dw	<350	<430	<380
2,4-Dimethylphenol, ug/kg dw	<350	<430	<380
Benzoic acid, ug/kg dw	<1800	<1900	<1900
bis(2-Chloroethoxy) methane, ug/kg dw	<350	<430	<380
2,4-Dichlorophenol, ug/kg dw	<350	<430	<380
1,2,4-Trichlorobenzene, ug/kg dw	<350	<430	<380

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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Naphthalene, ug/kg dw	520	<430	<380
4-Chloroaniline, ug/kg dw	<700	<850	<750
Hexachlorobutadiene, ug/kg dw	<350	<430	<380
4-Chloro-3-methylphenol, ug/kg dw	<350	<430	<380
2-Methylnapnthalene, ug/kg dw	<350	<430	<380
Hexachlorocyclopentadiene, ug/kg dw	<350	<430	<380
2,4,6-Trichlorophenol, ug/kg dw	<350	<430	<380
2,4,5-Trichlorophenol, ug/kg dw	<350	<430	<380
2-Chloronapnthalene, ug/kg dw	<350	<430	<380
2-Nitroaniline, ug/kg dw	<1800	<1900	<1900
Dimethylphthalate, ug/kg dw	<350	<430	<380
Acenaphthylene, ug/kg dw	<350	<430	<380
3-Nitroaniline, ug/kg dw	<1800	<1900	<1900
Acenaphthene, ug/kg dw	<350	<430	<380
2,4-Dinitrophenol, ug/kg dw	<1800	<1900	<1900
4-Nitrophenol, ug/kg dw	<1800	<1900	<1900
Dibenzofuran, ug/kg dw	<350	<430	<380
2,4-Dinitrotoluene, ug/kg dw	<350	<430	<380
2,6-Dinitrotoluene, ug/kg dw	<350	<430	<380
Diethylphthalate, ug/kg dw	<350	<430	<380
4-Chlorophenyl-phenyl ether, ug/kg dw	<350	<430	<380

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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Fluorene, ug/kg dw	<350	<430	<380
4-Nitroaniline, ug/kg dw	<1800	<1900	<1900
4,6-Dinitro-2-methylphenol, ug/kg dw	<1800	<1900	<1900
N-Nitrosodiphenylamine/diphenylamine, ug/kg dw	<350	<430	<380
4-Bromophenyl-phenyl-ether, ug/kg dw	<350	<430	<380
Hexachlorobenzene, ug/kg dw	<350	<430	<380
Pentachlorophenol, ug/kg dw	22000	<1900	<1900
Phenanthrene, ug/kg dw	930	<430	<380
Anthracene, ug/kg dw	<350	<430	<380
Di-n-butylphthalate, ug/kg dw	<350	<430	<380
Fluoranthene, ug/kg dw	1900	<430	<380
Pyrene, ug/kg dw	2100	<430	<380
Butylbenzylphthalate, ug/kg dw	<350	<430	<380
3,3'-Dichlorobenzidine, ug/kg dw	<700	<850	<750
Benzo(a)anthracene, ug/kg dw	1300	<430	<380
bis(2-Ethylhexyl) phthalate, ug/kg dw	<350	<430	<380
Chrysene, ug/kg dw	1500	<430	<380
Di-n-octylphthalate, ug/kg dw	<350	<430	<380
Benzo(b)fluoranthene, ug/kg dw	2200	<430	<380
Benzo(k)fluoranthene, ug/kg dw	1100	<430	<380
Benzo(a)pyrene, ug/kg dw	1600	<430	<380
Indeno (1,2,3-cd)pyrene, ug/kg dw	1200	<430	<380
Dibenzo (a,h)anthracene, ug/kg dw	<350	<430	<380
Benzo(g,h,i)perylene, ug/kg dw	1100	<430	<380

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
TCL Pesticides			
alpha-BHC, ug/kg dw	<2.2	<2.6	<2.3
beta-BHC, ug/kg dw	<2.2	<2.6	<2.3
delta-BHC, ug/kg dw	<2.2	<2.6	<2.3
gamma-BHC, ug/kg dw	<2.2	<2.6	<2.3
Heptachlor, ug/kg dw	<2.2	<2.6	<2.3
Aldrin, ug/kg dw	<2.2	<2.6	<2.3
Heptachlor epoxide, ug/kg dw	<4.3	<5.2	<4.6
Endosulfan I, ug/kg dw	<4.3	<5.2	<4.6
Dieldrin, ug/kg dw	<4.3	<5.2	<4.6
4,4'-DDE, ug/kg dw	<4.3	<5.2	<4.6
Endrin, ug/kg dw	<4.3	<5.2	<4.6
Endosulfan II, ug/kg dw	<11	<13	<11
4,4'-DDD, ug/kg dw	<4.3	<5.2	<4.3
Endosulfan sulfate, ug/kg dw	<17	<21	<18
4,4'-DDT, ug/kg dw	<11	<13	<11
Endrin ketone, ug/kg dw	<17	<21	<18
Methoxychlor, ug/kg dw	<86	<100	<92
alpha-Chlordane, ug/kg dw	<2.2	<2.6	<2.3
gamma-Chlordane, ug/kg dw	<2.2	<2.6	<2.3
Toxaphene, ug/kg dw	<170	<210	<180

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
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10360-2	SB-11 1.5-3.5' (11.28.89)	
10360-3	SB-12 1-3' (11.28.89)	

PARAMETER	10360-1	10360-2	10360-3
Aroclor-1016, ug/kg dw	<86	<100	<86
Aroclor-1221, ug/kg dw	<86	<100	<86
Aroclor-1232, ug/kg dw	<86	<100	<86
Aroclor-1242, ug/kg dw	<86	<100	<86
Aroclor-1248, ug/kg dw	<86	<100	<86
Aroclor-1254, ug/kg dw	<86	<100	<86
Aroclor-1260, ug/kg dw	<86	<100	<86
Percent Solids, %	93 %	77 %	87 %
NBS Library Search, ID	*	*	*
pH, units	9.7	9.1	8.4
Cyclohexylamine, ug/kg dw	<1400	<1700	<1500

Laboratory Name: SSVANNAH LABORATORIES

Case No: 10360

Sample Number
SB-10 1.5-3.5'

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	110918	Morpholine	SV	4.54	370.0
2.		UNKNOWN	SV	6.79	650.0
3.	928949	2-Hexen-1-01 (Z)	SV	7.79	53.0
4.		UNKNOWN	SV	9.45	37.0
5.		UNKNOWN	SV	12.86	61.0
6.		UNKNOWN	SV	13.25	28.0
7.		UNKNOWN	SV	13.39	25.0
8.		UNKNOWN	SV	14:02	47.0
9.		UNKNOWN	SV	14.46	35.0
10.		UNKNOWN	SV	14.63	36.0
11.		UNKNOWN	SV	14.76	23.0
12.		UNKNOWN	SV	14.87	27.0
13.		UNKNOWN	SV	15.12	67.0
14.	1483609	Benzene, 2,4-dimethyl-1-(1 methyl/propyl)	SV	15.36	32.0
15.	91576	Naphthalene, 2-methyl-	SV	15.84	41.0
16.		UNKNOWN	SV	15.94	48.0
17.	569415	Naphthalene, 1,8-dimethyl	SV	17.22	46.0
18.	571584	Naphthalene, 1-4-dimethyl-	SV	17.43	94.0
19.	573988	Naphthalene, 1,2-dimethyl-	SV	17.69	40.0
20.					
21.					
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Laboratory Name: SAVANNAH LABORATORIES

Case No: 10360

Sample Number
SB-11 1.5-3.5'

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	110918	Morpholine (ACN)	SV	4.50	330
2.	79345	Ethane, 1,1,2,2-tetrachloro-	SV	8.05	11
3.		UNKNOWN	SV	8.46	16
4.		UNKNOWN	SV	9.93	5
5.		UNKNOWN	SV	12.65	44
6.	1696204	Morpholine 4-acetyl-	SV	13.83	28
7.		UNKNOWN	SV	14.84	4.0
8.		UNKNOWN	SV	15.08	6.0
9.		UNKNOWN	SV	15.91	5.0
10.		UNKNOWN	SV	17.01	190
11.	569415	Naphthalene, 1,8-dimethyl-	SV	17.19	4.0
12.	569415	Naphthalene, 1,8-dimethyl-	SV	17.38	5.0
13.		UNKNOWN	SV	18.52	5.0
14.		UNKNOWN	SV	20.40	7.0
15.	10544500	Sulfur, mol.	SV	24.84	15.0
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Laboratory Name: SAVANNAH LABORATORIES

Case No: 10360

Sample Number
SB-10 5-7'

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	79345	Ethane, 1,1,2,2-tetrachloro-	SV	7.93	460
2.					
3.					
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

Laboratory Name: SAVANNAH LABORATORIES

Case No: 10360

Sample Number
SB-10 7-9'

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.	79345	Ethane, 1,1,2,2-tetrachloro-	SV	7.95	440
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

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LOG NO: 89-10360

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Project: 89204

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
Volatiles by GC/MS	
Chloromethane, ug/kg	<10
Bromomethane, ug/kg	<10
Vinyl Chloride, ug/kg	<10
Chloroethane, ug/kg	<10
Methylene Chloride, ug/kg	8
Acetone, ug/kg	<25
Carbon Disulfide, ug/kg	<5
1,1-Dichloroethylene, ug/kg	<5
1,1-Dichloroethane, ug/kg	<5
1,2-Dichloroethene, ug/kg	<5
Chloroform, ug/kg	<5
1,2-Dichloroethane, ug/kg	<5
2-Butanone, ug/kg	<10
1,1,1-Trichloroethane, ug/kg	<5
Carbon Tetrachloride, ug/kg	<5
Vinyl Acetate, ug/kg	<10
Bromodichloromethane, ug/kg	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5
1,2-Dichloropropane, ug/kg	<5
Trans-1,3-Dichloropropene, ug/kg	<5
Trichloroethylene, ug/kg	<5
Dibromochloromethane, ug/kg	<5

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REPORT OF ANALYTICAL RESULTS

Page

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED
10360-4	RR (11.28.89)	Cli

PARAMETER	10360-4
1,1,2-Trichloroethane, ug/kg	<5
Benzene, ug/kg	7
Cis-1,3-Dichloropropene, ug/kg	<5
Bromoform, ug/kg	<5
2-Hexanone, ug/kg	<10
4-methyl-2-pentanone, ug/kg	<10
Tetrachloroethylene, ug/kg	<5
Toluene, ug/kg	35
Chlorobenzene, ug/kg	<5
Ethylbenzene, ug/kg	<5
Styrene, ug/kg	<5
Xylenes, ug/kg	16

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
TCL Semivolatiles	
Phenol, ug/kg dw	<8700
bis(2-Chloroethyl) ether, ug/kg dw	<8700
2-Chlorophenol, ug/kg dw	<8700
1,3-Dichlorobenzene, ug/kg dw	<8700
1,4-Dichlorobenzene, ug/kg dw	<8700
Benzyl alcohol, ug/kg dw	<18000
1,2-Dichlorobenzene, ug/kg dw	<8700
2-Methylphenol (o-cresol), ug/kg dw	<8700
bis(2-Chloro-1-methylethyl) ether, ug/kg dw	<8700
4-Methylphenol (p-cresol), ug/kg dw	<8700
N-Nitroso-di-n-dipropylamine, ug/kg dw	<8700
Hexachloroethane, ug/kg dw	<8700
Nitrobenzene, ug/kg dw	<8700
Isophorone, ug/kg dw	<8700
2-Nitrophenol, ug/kg dw	<8700
2,4-Dimethylphenol, ug/kg dw	<8700
Benzoic acid, ug/kg dw	<44000
bis(2-Chloroethoxy) methane, ug/kg dw	<8700
2,4-Dichlorophenol, ug/kg dw	<8700
1,2,4-Trichlorobenzene, ug/kg dw	<8700
Naphthalene, ug/kg dw	<8700
4-Chloroaniline, ug/kg dw	<18000

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
Hexachlorobutadiene, ug/kg dw	<8700
4-Chloro-3-methylphenol, ug/kg dw	<8700
2-Methylnaphthalene, ug/kg dw	<8700
Hexachlorocyclopentadiene, ug/kg dw	<8700
2,4,6-Trichlorophenol, ug/kg dw	<8700
2,4,5-Trichlorophenol, ug/kg dw	<8700
2-Chloronaphthalene, ug/kg dw	<8700
2-Nitroaniline, ug/kg dw	<44000
Dimethylphthalate, ug/kg dw	<8700
Acenaphthylene, ug/kg dw	<8700
3-Nitroaniline, ug/kg dw	<44000
Acenaphthene, ug/kg dw	<8700
2,4-Dinitrophenol, ug/kg dw	<44000
4-Nitrophenol, ug/kg dw	<44000
Dibenzofuran, ug/kg dw	<8700
2,4-Dinitrotoluene, ug/kg dw	<8700
2,6-Dinitrotoluene, ug/kg dw	<8700
Diethylphthalate, ug/kg dw	<8700
4-Chlorophenyl-phenyl ether, ug/kg dw	<8700
Fluorene, ug/kg dw	<8700
4-Nitroaniline, ug/kg dw	<44000
4,6-Dinitro-2-methylphenol, ug/kg dw	<44000
N-Nitrosodiphenylamine/diphenylamine, ug/kg dw	<8700

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
4-Bromophenyl-phenyl-ether, ug/kg dw	<8700
Hexachlorobenzene, ug/kg dw	<8700
Pentachlorophenol, ug/kg dw	<44000
Phenanthrene, ug/kg dw	<8700
Anthracene, ug/kg dw	<8700
Di-n-butylphthalate, ug/kg dw	<8700
Fluoranthene, ug/kg dw	<8700
Pyrene, ug/kg dw	9100
Butylbenzylphthalate, ug/kg dw	<8700
3,3'-Dichlorobenzidine, ug/kg dw	<18000
Benzo(a)anthracene, ug/kg dw	<8700
bis(2-Ethylhexyl) phthalate, ug/kg dw	<8700
Chrysene, ug/kg dw	<8700
Di-n-octylphthalate, ug/kg dw	<8700
Benzo(b)fluoranthene, ug/kg dw	<8700
Benzo(k)fluoranthene, ug/kg dw	<8700
Benzo(a)pyrene, ug/kg dw	<8700
Indeno (1,2,3-cd)pyrene, ug/kg dw	<8700
Dibenzo (a,h)anthracene, ug/kg dw	<8700
Benzo(g,h,i)perylene, ug/kg dw	<8700

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
TCL Pesticides	
alpha-BHC, ug/kg dw	<130
beta-BHC, ug/kg dw	<130
delta-BHC, ug/kg dw	<130
gamma-BHC, ug/kg dw	<130
Heptachlor, ug/kg dw	<130
Aldrin, ug/kg dw	<130
Heptachlor epoxide, ug/kg dw	<270
Endosulfan I, ug/kg dw	<270
Dieldrin, ug/kg dw	<270
4,4'-DDE, ug/kg dw	<270
Endrin, ug/kg dw	<270
Endosulfan II, ug/kg dw	<670
4,4'-DDD, ug/kg dw	<270
Endosulfan sulfate, ug/kg dw	<1100
4,4'-DDT, ug/kg dw	<670
Endrin ketone, ug/kg dw	<1100
Methoxychlor, ug/kg dw	<5300
alpha-Chlordane, ug/kg dw	<130
gamma-Chlordane, ug/kg dw	<130
Toxaphene, ug/kg dw	<1100
Aroclor-1016, ug/kg dw	<5300
Aroclor-1221, ug/kg dw	<5300
Aroclor-1232, ug/kg dw	<5300
Aroclor-1242, ug/kg dw	<5300
Aroclor-1248, ug/kg dw	<5300
Aroclor-1254, ug/kg dw	<5300
Aroclor-1260, ug/kg dw	<5300

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-4	RR (11.28.89)	Client

PARAMETER	10360-4
Percent Solids, %	75 %
NBS Library Search, ID	*
pH, units	9.6
Cyclohexylamine, ug/kg dw	<35000

Laboratory Name: SAVANNAH LABORATORIES

Case No: 10360

Sample Number
RR

Organics Analysis Data Sheet

NO PEAKS FOUND

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
TCL Semivolatiles			
Phenol, ug/l	<80	<80	<80
bis(2-Chlorcethyl) ether, ug/l	<80	<80	<80
2-Chlorophenol, ug/l	<80	<80	<80
1,3-Dichlorobenzene, ug/l	<80	<80	<80
1,4-Dichlorobenzene, ug/l	<80	<80	<80
Benzyl alcohol, ug/l	<160	<160	<160
1,2-Dichlorobenzene, ug/l	<80	<80	<80
2-Methylphenol (o-cresol), ug/l	<80	<80	<80
bis(2-Chloro-1-methylethyl) ether, ug/l	<80	<80	<80
4-Methylphenol (p-cresol), ug/l	<80	<80	<80
N-Nitroso-di-n-dipropylamine, ug/l	<80	<80	<80
Hexachloroethane, ug/l	<80	<80	<80
Nitrobenzene, ug/l	<80	<80	<80
Isophorone, ug/l	<80	<80	<80
2-Nitrophenol, ug/l	<80	<80	<80
2,4-Dimethylphenol, ug/l	<80	<80	<80
Benzoic acid, ug/l	<400	<400	<400
bis(2-Chloroethoxy) methane, ug/l	<80	<80	<80
2,4-Dichlorophenol, ug/l	<80	<80	<80
1,2,4-Trichlorobenzene, ug/l	<80	<80	<80

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Project: 89204

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
Naphthalene, ug/l	<80	<80	<80
4-Chloroaniline, ug/l	<160	<160	<160
Hexachlorobutadiene, ug/l	<80	<80	<80
4-Chloro-3-methylphenol, ug/l	<80	<80	<80
2-Methylnaphthalene, ug/l	<80	<80	<80
Hexachlorocyclopentadiene, ug/l	<80	<80	<80
2,4,6-Trichlorophenol, ug/l	<80	<80	<80
2,4,5-Trichlorophenol, ug/l	<80	<80	<80
2-Chloronaphthalene, ug/l	<80	<80	<80
2-Nitroaniline, ug/l	<400	<400	<400
Dimethylphthalate, ug/l	<80	<80	<80
Acenaphthylene, ug/l	<80	<80	<80
3-Nitroaniline, ug/l	<400	<400	<400
Acenaphthene, ug/l	<80	<80	<80
2,4-Dinitrophenol, ug/l	<400	<400	<400
4-Nitrophenol, ug/l	<400	<400	<400
Dibenzofuran, ug/l	<80	<80	<80
2,4-Dinitrotoluene, ug/l	<80	<80	<80
2,6-Dinitrotoluene, ug/l	<80	<80	<80
Diethylphthalate, ug/l	<80	<80	<80
4-Chlorophenyl-phenyl ether, ug/l	<80	<80	<80

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
Fluorene, ug/l	<80	<80	<80
4-Nitroaniline, ug/l	<400	<400	<400
4,6-Dinitro-2-methylphenol, ug/l	<400	<400	<400
N-Nitrosodiphenylamine/diphenylamine, ug/l	<80	<80	<80
4-Bromophenyl-phenyl-ether, ug/l	<80	<80	<80
Hexachlorobenzene, ug/l	<80	<80	<80
Pentachlorophenol, ug/l	<400	<400	<400
Phenanthrene, ug/l	<80	<80	<80
Anthracene, ug/l	<80	<80	<80
Di-n-butylphthalate, ug/l	<80	<80	<80
Fluoranthene, ug/l	<80	<80	<80
Pyrene, ug/l	<80	<80	<80
Butylbenzylphthalate, ug/l	<80	<80	<80
3,3'-Dichlorobenzidine, ug/l	<160	<160	<160
Benzo(a)anthracene, ug/l	<80	<80	<80
bis(2-Ethylhexyl) phthalate, ug/l	<80	<80	<80
Chrysene, ug/l	<80	<80	<80
Di-n-octylphthalate, ug/l	<80	<80	<80
Benzo(b)fluoranthene, ug/l	<80	<80	<80
Benzo(k)fluoranthene, ug/l	<80	<80	<80
Benzo(a)pyrene, ug/l	<80	<80	<80
Indeno (1,2,3-cd)pyrene, ug/l	<80	<80	<80
Dibenzo (a,h)anthracene, ug/l	<80	<80	<80
Benzo(g,h,i)perylene, ug/l	<80	<80	<80

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
TCL Pesticides			
alpha-BHC, ug/l	<0.010	<0.010	<0.010
beta-BHC, ug/l	<0.010	<0.010	<0.010
delta-BHC, ug/l	<0.010	<0.010	<0.010
gamma-BHC, ug/l	<0.010	<0.010	<0.010
Heptachlor, ug/l	<0.010	<0.010	<0.010
Aldrin, ug/l	<0.010	<0.010	<0.010
Heptachlor epoxide, ug/l	<0.020	<0.020	<0.020
Endosulfan I, ug/l	<0.020	<0.020	<0.020
Dieldrin, ug/l	<0.020	<0.020	<0.020
4,4'-DDE, ug/l	<0.020	<0.020	<0.020
Endrin, ug/l	<0.020	<0.020	<0.020
Endosulfan II, ug/l	<0.050	<0.050	<0.050
4,4'-DDD, ug/l	<0.020	<0.020	<0.020
Endosulfan sulfate, ug/l	<0.10	<0.10	<0.10
4,4'-DDT, ug/l	<0.050	<0.050	<0.050
Endrin ketone, ug/l	<0.10	<0.10	<0.10
Methoxychlor, ug/l	<0.50	<0.50	<0.50
alpha-Chlordane, ug/l	<0.010	<0.010	<0.010
gamma-Chlordane, ug/l	<0.010	<0.010	<0.010
Toxaphene, ug/l	<1.0	<1.0	<1.0

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
Aroclor-1016, ug/l	<0.50	<0.50	<0.50
Aroclor-1221, ug/l	<0.50	<0.50	<0.50
Aroclor-1232, ug/l	<0.50	<0.50	<0.50
Aroclor-1242, ug/l	<0.50	<0.50	<0.50
Aroclor-1248, ug/l	<0.50	<0.50	<0.50
Aroclor-1254, ug/l	<0.50	<0.50	<0.50
Aroclor-1260, ug/l	<0.50	<0.50	<0.50

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	SAMPLED BY
10359-1	MW-1 (11.29.89)	Client
10359-2	MW-2 (11.29.89)	
10359-3	MW-3 (11.29.89)	

PARAMETER	10359-1	10359-2	10359-3
Volatiles by GC/MS			
Chloromethane, ug/l	<10	<10	<10
Bromomethane, ug/l	<10	<10	<10
Vinyl Chloride, ug/l	<10	<10	<10
Chloroethane, ug/l	<10	<10	<10
Methylene Chloride, ug/l	<5	<5	<5
Acetone, ug/l	<25	<25	<25
Carbon Disulfide, ug/l	<5	<5	<5
1,1-Dichloroethylene, ug/l	<5	<5	<5
1,1-Dichloroethane, ug/l	<5	<5	<5
1,2-Dichloroethene, ug/l	<5	23	<5
Chloroform, ug/l	<5	<5	<5
1,2-Dichloroethane, ug/l	<5	<5	<5
2-Butanone, ug/l	<10	<10	<10
1,1,1-Trichloroethane, ug/l	<5	<5	<5
Carbon Tetrachloride, ug/l	<5	<5	<5
Vinyl Acetate, ug/l	<10	<10	<10
Bromodichloromethane, ug/l	<5	<5	<5
1,1,2,2-Tetrachloroethane, ug/l	<5	<5	<5
1,2-Dichloropropane, ug/l	<5	<5	<5
Trans-1,3-Dichloropropene, ug/l	<5	<5	<5

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LOG NO: 89-10360

Received: 30 NOV 89

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Project: 89204

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , QC SAMPLES	SAMPLED BY
10360-5	Detection Limits	Client
10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER	10360-5	10360-6	10360-7
Volatiles by GC/MS			
Chloromethane, ug/kg	10	—	—
Bromomethane, ug/kg	10	—	—
Vinyl Chloride, ug/kg	10	—	—
Chloroethane, ug/kg	10	—	—
Methylene Chloride, ug/kg	5	—	—
Acetone, ug/kg	25	—	—
Carbon Disulfide, ug/kg	5	—	—
1,1-Dichloroethylene, ug/kg	5	103 %	4.9 %
1,1-Dichloroethane, ug/kg	5	—	—
1,2-Dichloroethene, ug/kg	5	—	—
Chloroform, ug/kg	5	—	—
1,2-Dichloroethane, ug/kg	5	—	—
2-Butanone, ug/kg	10	—	—
1,1,1-Trichloroethane, ug/kg	5	—	—
Carbon Tetrachloride, ug/kg	5	—	—
Vinyl Acetate, ug/kg	10	—	—
Bromodichloromethane, ug/kg	5	—	—
1,1,2,2-Tetrachloroethane, ug/kg	5	—	—
1,2-Dichloropropane, ug/kg	5	—	—
Trans-1,3-Dichloropropene, ug/kg	5	—	—

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10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER			10360-5	10360-6	10360-7
Trichloroethylene, ug/kg			5	85 %	1.2 %
Dibromochloromethane, ug/kg			5	—	—
1,1,2-Trichloroethane, ug/kg			5	—	—
Benzene, ug/kg			5	100 %	1.0 %
Cis-1,3-Dichloropropene, ug/kg			5	—	—
Bromoform, ug/kg			5	—	—
2-Hexanone, ug/kg			10	—	—
4-methyl-2-pentanone, ug/kg			10	—	—
Tetrachloroethylene, ug/kg			5	—	—
Toluene, ug/kg			5	113 %	0.9 %
Chlorobenzene, ug/kg			5	101 %	5.0 %
Ethylbenzene, ug/kg			5	—	—
Styrene, ug/kg			5	—	—
Xylenes, ug/kg			5	—	—

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10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER			10360-5	10360-6	10360-7
TCL Semivolatiles					
Phenol, ug/kg dw			330	72 %	8.3 %
bis(2-Chloroethyl) ether, ug/kg dw			330	76 %	6.6 %
2-Chlorophenol, ug/kg dw			330	—	—
1,3-Dichlorobenzene, ug/kg dw			330	—	—
1,4-Dichlorobenzene, ug/kg dw			330	80 %	6.3 %
Benzyl alcohol, ug/kg dw			670	—	—
1,2-Dichlorobenzene, ug/kg dw			330	—	—
2-Methylphenol (o-cresol), ug/kg dw			330	—	—
bis(2-Chloro-1-methylethyl) ether, ug/kg dw			330	—	—
4-Methylphenol (p-cresol), ug/kg dw			330	—	—
N-Nitroso-di-n-dipropylamine, ug/kg dw			330	81 %	8.6 %
Hexachloroethane, ug/kg dw			330	—	—
Nitrobenzene, ug/kg dw			330	—	—
Isophorone, ug/kg dw			330	—	—
2-Nitrophenol, ug/kg dw			330	—	—
2,4-Dimethylphenol, ug/kg dw			330	—	—
Benzoic acid, ug/kg dw			1700	—	—
bis(2-Chloroethoxy) methane, ug/kg dw			330	—	—
2,4-Dichlorophenol, ug/kg dw			330	—	—
1,2,4-Trichlorobenzene, ug/kg dw			330	84 %	4.7 %

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10360-5	Detection Limits	Client
10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER	10360-5	10360-6	10360-7
Naphthalene, ug/kg dw	330	—	—
4-Chloroaniline, ug/kg dw	670	—	—
Hexachlorobutadiene, ug/kg dw	330	—	—
4-Chloro-3-methylphenol, ug/kg dw	330	80 %	5.0 %
2-Methylnaphthalene, ug/kg dw	330	—	—
Hexachlorocyclopentadiene, ug/kg dw	330	—	—
2,4,6-Trichlorophenol, ug/kg dw	330	—	—
2,4,5-Trichlorophenol, ug/kg dw	330	—	—
2-Chloronaphthalene, ug/kg dw	330	—	—
2-Nitroaniline, ug/kg dw	1700	—	—
Dimethylphthalate, ug/kg dw	330	—	—
Acenaphthylene, ug/kg dw	330	—	—
3-Nitroaniline, ug/kg dw	1700	—	—
Acenaphthene, ug/kg dw	330	79 %	2.5 %
2,4-Dinitrophenol, ug/kg dw	1700	—	—
4-Nitrophenol, ug/kg dw	1700	72 %	25 %
Dibenzofuran, ug/kg dw	330	—	—
2,4-Dinitrotoluene, ug/kg dw	330	65 %	15 %
2,6-Dinitrotoluene, ug/kg dw	330	—	—
Diethylphthalate, ug/kg dw	330	—	—
4-Chlorophenyl-phenyl ether, ug/kg dw	330	—	—

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10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER			10360-5	10360-6	10360-7
Fluorene, ug/kg dw			330	—	—
4-Nitroaniline, ug/kg dw			1700	—	—
4,6-Dinitro-2-methylphenol, ug/kg dw			1700	—	—
N-Nitrosodiphenylamine/diphenylamine, ug/kg dw			330	—	—
4-Bromophenyl-phenyl-ether, ug/kg dw			330	—	—
Hexachlorobenzene, ug/kg dw			330	—	—
Pentachlorophenol, ug/kg dw			1700	81 %	8.6 %
Phenanthrene, ug/kg dw			330	—	—
Anthracene, ug/kg dw			330	—	—
Di-n-butylphthalate, ug/kg dw			330	—	—
Fluoranthene, ug/kg dw			330	—	—
Pyrene, ug/kg dw			330	88 %	0 %
Butylbenzylphthalate, ug/kg dw			330	—	—
3,3'-Dichlorobenzidine, ug/kg dw			670	—	—
Benzo(a)anthracene, ug/kg dw			330	—	—
bis(2-Ethylhexyl) phthalate, ug/kg dw			330	—	—
Chrysene, ug/kg dw			330	—	—
Di-n-octylphthalate, ug/kg dw			330	—	—
Benzo(b)fluoranthene, ug/kg dw			330	—	—
Benzo(k)fluoranthene, ug/kg dw			330	—	—
Benzo(a)pyrene, ug/kg dw			330	—	—
Indeno (1,2,3-cd)pyrene, ug/kg dw			330	—	—
Dibenzo (a,h)anthracene, ug/kg dw			330	—	—
Benzo(g,h,i)perylene, ug/kg dw			330	—	—

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10360-5	Detection Limits	Client
10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER	10360-5	10360-6	10360-7
TCL Pesticides			
alpha-BHC, ug/kg dw	2.0	—	—
beta-BHC, ug/kg dw	2.0	—	—
delta-BHC, ug/kg dw	2.0	—	—
gamma-BHC, ug/kg dw	2.0	124 %	4.0 %
Heptachlor, ug/kg dw	2.0	125 %	5.6 %
Aldrin, ug/kg dw	2.0	116 %	6.0 %
Heptachlor epoxide, ug/kg dw	4.0	—	—
Endosulfan I, ug/kg dw	4.0	—	—
Dieldrin, ug/kg dw	4.0	116 %	0.9 %
4,4'-DDE, ug/kg dw	4.0	—	—
Endrin, ug/kg dw	4.0	118 %	0.8 %
Endosulfan II, ug/kg dw	10	—	—
4,4'-DDD, ug/kg dw	4.0	—	—
Endosulfan sulfate, ug/kg dw	16	—	—
4,4'-DDT, ug/kg dw	10	126 %	6.3 %
Endrin ketone, ug/kg dw	16	—	—
Methoxychlor, ug/kg dw	80	—	—
alpha-Chlordane, ug/kg dw	2.0	—	—
gamma-Chlordane, ug/kg dw	2.0	—	—
Toxaphene, ug/kg dw	160	—	—

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10360-5	Detection Limits	Client
10360-6	Accuracy (Mean % Recovery)	
10360-7	Precision (% RPD)	

PARAMETER		10360-5	10360-6	10360-7
Aroclor-1016, ug/kg dw		80	---	---
Aroclor-1221, ug/kg dw		80	---	---
Aroclor-1232, ug/kg dw		80	---	---
Aroclor-1242, ug/kg dw		80	---	---
Aroclor-1248, ug/kg dw		80	---	---
Aroclor-1254, ug/kg dw		80	---	---
Aroclor-1260, ug/kg dw		80	---	---

Methods: EPA SW-846.

Steven J. White

Steven J. White

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , QC SAMPLES	SAMPLED BY
10359-4	Detection Limits	Client
10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER		10359-4	10359-5	10359-6
TCL Semivolatiles				
Phenol, ug/l		10	61 %	3.3 %
bis(2-Chloroethyl) ether, ug/l		10	—	—
2-Chlorophenol, ug/l		10	50 %	4.0 %
1,3-Dichlorobenzene, ug/l		10	—	—
1,4-Dichlorobenzene, ug/l		10	56 %	7.1 %
Benzyl alcohol, ug/l		20	—	—
1,2-Dichlorobenzene, ug/l		10	—	—
2-Methylphenol (o-cresol), ug/l		10	—	—
bis(2-Chloro-1-methylethyl) ether, ug/l		10	—	—
4-Methylphenol (p-cresol), ug/l		10	—	—
N-Nitroso-di-n-dipropylamine, ug/l		10	82 %	4.9 %
Hexachloroethane, ug/l		10	—	—
Nitrobenzene, ug/l		10	—	—
Isophorone, ug/l		10	—	—
2-Nitrophenol, ug/l		10	—	—
2,4-Dimethylphenol, ug/l		10	—	—
Benzoic acid, ug/l		50	—	—
bis(2-Chloroethoxy) methane, ug/l		10	—	—
2,4-Dichlorophenol, ug/l		10	—	—
1,2,4-Trichlorobenzene, ug/l		10	98 %	4.1 %

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10359-4	Detection Limits	Client
10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER		10359-4	10359-5	10359-6
Naphthalene, ug/l		10	—	—
4-Chloroaniline, ug/l		20	—	—
Hexachlorobutadiene, ug/l		10	—	—
4-Chloro-3-methylphenol, ug/l		10	76 %	7.9 %
2-Methylnaphthalene, ug/l		10	—	—
Hexachlorocyclopentadiene, ug/l		10	—	—
2,4,6-Trichlorophenol, ug/l		10	—	—
2,4,5-Trichlorophenol, ug/l		10	—	—
2-Chloronaphthalene, ug/l		10	—	—
2-Nitroaniline, ug/l		50	—	—
Dimethylphthalate, ug/l		10	—	—
Acenaphthylene, ug/l		10	—	—
3-Nitroaniline, ug/l		50	—	—
Acenaphthene, ug/l		10	100 %	4.0 %
2,4-Dinitrophenol, ug/l		50	—	—
4-Nitrophenol, ug/l		50	37 %	16 %
Dibenzofuran, ug/l		10	—	—
2,4-Dinitrotoluene, ug/l		10	83 %	2.4 %
2,6-Dinitrotoluene, ug/l		10	—	—
Diethylphthalate, ug/l		10	—	—
4-Chlorophenyl-phenyl ether, ug/l		10	—	—

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10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER		10359-4	10359-5	10359-6
Fluorene, ug/l		10	—	—
4-Nitroaniline, ug/l		50	—	—
4,6-Dinitro-2-methylphenol, ug/l		50	—	—
N-Nitrosodiphenylamine/diphenylamine, ug/l		10	—	—
4-Bromophenyl-phenyl-ether, ug/l		10	—	—
Hexachlorobenzene, ug/l		10	—	—
Pentachlorophenol, ug/l		50	67 %	2.9 %
Phenanthrene, ug/l		10	—	—
Anthracene, ug/l		10	—	—
Di-n-butylphthalate, ug/l		10	—	—
Fluoranthene, ug/l		10	—	—
Pyrene, ug/l		10	85 %	2.4 %
Butylbenzylphthalate, ug/l		10	—	—
3,3'-Dichlorobenzidine, ug/l		20	—	—
Benzo(a)anthracene, ug/l		10	—	—
bis(2-Ethylhexyl) phthalate, ug/l		10	—	—
Chrysene, ug/l		10	—	—
Di-n-octylphthalate, ug/l		10	—	—
Benzo(b)fluoranthene, ug/l		10	—	—
Benzo(k)fluoranthene, ug/l		10	—	—
Benzo(a)pyrene, ug/l		10	—	—
Indeno (1,2,3-cd)pyrene, ug/l		10	—	—
Dibenzo (a,h)anthracene, ug/l		10	—	—
Benzo(g,h,i)perylene, ug/l		10	—	—

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10359-6	Precision (% RPD)	

PARAMETER	10359-4	10359-5	10359-6
TCL Pesticides			
alpha-BHC, ug/l	0.010	—	—
beta-BHC, ug/l	0.010	—	—
delta-BHC, ug/l	0.010	—	—
gamma-BHC, ug/l	0.010	107 %	1.9 %
Heptachlor, ug/l	0.010	101 %	3.0 %
Aldrin, ug/l	0.010	94 %	3.2 %
Heptachlor epoxide, ug/l	0.020	—	—
Endosulfan I, ug/l	0.020	—	—
Dieldrin, ug/l	0.020	100 %	8.0 %
4,4'-DDE, ug/l	0.020	—	—
Endrin, ug/l	0.020	118 %	5.1 %
Endosulfan II, ug/l	0.050	—	—
4,4'-DDD, ug/l	0.020	—	—
Endosulfan sulfate, ug/l	0.10	—	—
4,4'-DDT, ug/l	0.050	—	—
Endrin ketone, ug/l	0.10	—	—
Methoxychlor, ug/l	0.50	—	—
alpha-Chlordane, ug/l	0.010	—	—
gamma-Chlordane, ug/l	0.010	—	—
Toxaphene, ug/l	1.0	—	—

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10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER	10359-4	10359-5	10359-6
Aroclor-1016, ug/l	0.50	—	—
Aroclor-1221, ug/l	0.50	—	—
Aroclor-1232, ug/l	0.50	—	—
Aroclor-1242, ug/l	0.50	—	—
Aroclor-1248, ug/l	0.50	—	—
Aroclor-1254, ug/l	0.50	—	—
Aroclor-1260, ug/l	0.50	—	—

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10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER		10359-4	10359-5	10359-6
Volatiles by GC/MS				
Chloromethane, ug/l		10	—	—
Bromomethane, ug/l		10	—	—
Vinyl Chloride, ug/l		10	—	—
Chloroethane, ug/l		10	—	—
Methylene Chloride, ug/l		5	—	—
Acetone, ug/l		25	—	—
Carbon Disulfide, ug/l		5	—	—
1,1-Dichloroethylene, ug/l		5	91 %	1.1 %
1,1-Dichloroethane, ug/l		5	—	—
1,2-Dichloroethene, ug/l		5	—	—
Chloroform, ug/l		5	—	—
1,2-Dichloroethane, ug/l		5	—	—
2-Butanone, ug/l		10	—	—
1,1,1-Trichloroethane, ug/l		5	—	—
Carbon Tetrachloride, ug/l		5	—	—
Vinyl Acetate, ug/l		10	—	—
Bromodichloromethane, ug/l		5	—	—
1,1,2,2-Tetrachloroethane, ug/l		5	—	—
1,2-Dichloropropane, ug/l		5	—	—
Trans-1,3-Dichloropropene, ug/l		5	—	—

James W. Andrews, Ph.D.
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Janette Davis Long
Vice-President

SAVANNAH LABORATORIES
AND ENVIRONMENTAL SERVICES, INC.
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(912) 354-7858

LOG NO: 89-10359

Received: 30 NOV 89

Mr. Marty Knuth
Civil & Env. Consultants Inc.
790 Holiday Drive
Pittsburgh, PA 15220

Project: 89204

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , QC SAMPLES	SAMPLED BY
10359-4	Detection Limits	Client
10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER		10359-4	10359-5	10359-6
Trichloroethylene, ug/l		5	98 %	4.1 %
Dibromochloromethane, ug/l		5	—	—
1,1,2-Trichloroethane, ug/l		5	—	—
Benzene, ug/l		5	99 %	3.0 %
Cis-1,3-Dichloropropene, ug/l		5	—	—
Bromoform, ug/l		5	—	—
2-Hexanone, ug/l		10	—	—
4-methyl-2-pentanone, ug/l		10	—	—
Tetrachloroethylene, ug/l		5	—	—
Toluene, ug/l		5	97 %	3.1 %
Chlorobenzene, ug/l		5	99 %	3.0 %
Ethylbenzene, ug/l		5	—	—
Styrene, ug/l		5	—	—
Xylenes, ug/l		5	—	—
Cyanide, mg/l		0.020	79 %	13 %
Aluminum (Dissolved), mg/l		0.10	112 %	0.89 %
Antimony (Dissolved), mg/l		0.050	103 %	0 %
Arsenic (Dissolved), mg/l		0.010	125 %	0 %
Barium (Dissolved), mg/l		0.010	104 %	3.8 %
Beryllium (Dissolved), mg/l		0.0050	95 %	1.0 %
Cadmium (Dissolved), mg/l		0.0050	115 %	1.7 %

Laboratory Name: SAVANNAH LABORATORIES

Case No: 10360

Sample Number
SB-12 1-3'

Organics Analysis Data Sheet

	CAS Number	Compound Name	Fraction	RT or Scan Number	Estimated Concentration (ug/l or ug/kg)
1.		UNKNOWN	SV	12.06	16.0
2.					
3.					
4.					
5.					
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9.					
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14.					
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22.					
23.					
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26.					
27.					
28.					
29.					
30.					

*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.

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Project: 89204

PARTIAL
REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 5-7'	Client
10360-2	SB-10 7-9'	

PARAMETER	10360-1	10360-2
TCL Semivolatiles		
Phenol, ug/kg dw	<470	<440
bis(2-Chloroethyl) ether, ug/kg dw	<470	<440
2-Chlorophenol, ug/kg dw	<470	<440
1,3-Dichlorobenzene, ug/kg dw	<470	<440
1,4-Dichlorobenzene, ug/kg dw	<470	<440
Benzyl alcohol, ug/kg dw	<470	<440
1,2-Dichlorobenzene, ug/kg dw	<470	<440
2-Methylphenol (o-cresol), ug/kg dw	<470	<440
bis(2-Chloro-1-methylethyl) ether, ug/kg dw	<470	<440
4-Methylphenol (p-cresol), ug/kg dw	<470	<440
N-Nitroso-di-n-dipropylamine, ug/kg dw	<470	<440
Hexachloroethane, ug/kg dw	<470	<440
Nitrobenzene, ug/kg dw	<470	<440
Isophorone, ug/kg dw	<470	<440
2-Nitrophenol, ug/kg dw	<470	<440
2,4-Dimethylphenol, ug/kg dw	<470	<440
Benzoic acid, ug/kg dw	<2400	<2200
bis(2-Chloroethoxy) methane, ug/kg dw	<470	<440
2,4-Dichlorophenol, ug/kg dw	<470	<440
1,2,4-Trichlorobenzene, ug/kg dw	<470	<440
Naphthalene, ug/kg dw	<470	<440

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 5-7'	Client
10360-2	SB-10 7-9'	

PARAMETER	10360-1	10360-2
4-Chloroaniline, ug/kg dw	<940	<880
Hexachlorobutadiene, ug/kg dw	<470	<440
4-Chloro-3-methylphenol, ug/kg dw	<470	<440
2-Methylnaphthalene, ug/kg dw	<470	<440
Hexachlorocyclopentadiene, ug/kg dw	<470	<440
2,4,6-Trichlorophenol, ug/kg dw	<470	<440
2,4,5-Trichlorophenol, ug/kg dw	<470	<440
2-Chloronaphthalene, ug/kg dw	<470	<440
2-Nitroaniline, ug/kg dw	<2400	<2200
Dimethylphthalate, ug/kg dw	<470	<440
Acenaphthylene, ug/kg dw	<470	<440
3-Nitroaniline, ug/kg dw	<2400	<2200
Acenaphthene, ug/kg dw	<470	<440
2,4-Dinitrophenol, ug/kg dw	<2400	<2200
4-Nitrophenol, ug/kg dw	<2400	<2200
Dibenzofuran, ug/kg dw	<470	<440
2,4-Dinitrotoluene, ug/kg dw	<470	<440
2,6-Dinitrotoluene, ug/kg dw	<470	<440
Diethylphthalate, ug/kg dw	<470	<440
4-Chlorophenyl-phenyl ether, ug/kg dw	<470	<440
Fluorene, ug/kg dw	<470	<440
4-Nitroaniline, ug/kg dw	<2400	<2200

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LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 5-7'	Client
10360-2	SB-10 7-9'	

PARAMETER	10360-1	10360-2	
4,6-Dinitro-2-methylphenol, ug/kg dw	<2400	<2200	
N-Nitrosodiphenylamine/diphenylamine, ug/kg dw	<470	<440	
4-Bromophenyl-phenyl-ether, ug/kg dw	<470	<440	
Hexachlorobenzene, ug/kg dw	<470	<440	
Pentachlorophenol, ug/kg dw	<2400	<2200	
Phenanthrene, ug/kg dw	<470	<440	
Anthracene, ug/kg dw	<470	<440	
Di-n-butylphthalate, ug/kg dw	<470	<440	
Fluoranthene, ug/kg dw	<470	<440	
Pyrene, ug/kg dw	<470	<440	
Butylbenzylphthalate, ug/kg dw	<470	<440	
3,3'-Dichlorobenzidine, ug/kg dw	<940	<880	
Benzo(a)anthracene, ug/kg dw	<470	<440	
bis(2-Ethylhexyl) phthalate, ug/kg dw	<470	<440	
Chrysene, ug/kg dw	<470	<440	
Di-n-octylphthalate, ug/kg dw	<470	<440	
Benzo(b)fluoranthene, ug/kg dw	<470	<440	
Benzo(k)fluoranthene, ug/kg dw	<470	<440	
Benzo(a)pyrene, ug/kg dw	<470	<440	
Indeno (1,2,3-cd)pyrene, ug/kg dw	<470	<440	
Dibenzo (a,h)anthracene, ug/kg dw	<470	<440	
Benzo(g,h,i)perylene, ug/kg dw	<470	<440	

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PARTIAL
REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	SAMPLED BY
10360-1	SB-10 5-7'	Client
10360-2	SB-10 7-9'	

PARAMETER	10360-1	10360-2
NBS Library Search Cyclohexylamine, ug/kg dw	<1900	<1900

Methods: EPA SW-846.

Steven J. White

Steven J. White

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LOG NO	SAMPLE DESCRIPTION , QC SAMPLES	SAMPLED BY
10359-4	Detection Limits	Client
10359-5	Accuracy (Mean % Recovery)	
10359-6	Precision (% RPD)	

PARAMETER	10359-4	10359-5	10359-6
Calcium (Dissolved), mg/l	0.050	75 %	0 %
Chromium (Dissolved), mg/l	0.010	107 %	0 %
Cobalt (Dissolved), mg/l	0.010	106 %	0.94 %
Copper (Dissolved), mg/l	0.010	105 %	0.95 %
Iron (Dissolved), mg/l	0.010	106 %	0 %
Lead (Dissolved)	0.0050	85 %	0 %
Magnesium (Dissolved), mg/l	0.050	99 %	1.0 %
Manganese (Dissolved), mg/l	0.010	97 %	1.0 %
Mercury (Dissolved), mg/l	0.00020	116 %	0.86 %
Nickel (Dissolved), mg/l	0.010	106 %	0.94 %
Potassium (Dissolved), mg/l	1.0	121 %	6.6 %
Selenium (Dissolved), mg/l	0.010	108 %	2.7 %
Silver (Dissolved)	0.010	76 %	0 %
Sodium (Dissolved), mg/l	0.050	118 %	1.0 %
Thallium (Dissolved), mg/l	0.010	102 %	13 %
Vanadium (Dissolved), mg/l	0.010	109 %	0 %
Zinc (Dissolved), mg/l	0.010	114 %	0.88 %

Methods: EPA 40 CFR Part 136.

Steven J. White

Steven J. White

Laboratory Name: SAVANNAH LABORATORIES

Case No: 1128A11A

Sample Number
10141 SB-4

Organics Analysis Data Sheet

30.38g 79%
FV = 1.0

	CAS Number	Compound Name	Fraction	(AT) or Scan Number	Estimated Concentration (ug/l or (ug/kg))
1.	79345	Ethane, 1,1,2,2-tetrachloro-	BN/A	6.667	310
2.	11544500	Sulfur, mol.	BN/A	23.114	9700
3.		Unknown	BN/A	30.715	200
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*Compound was identified by the comparison of the unknown peak with mass spectra stored in the National Bureau of Standards (NBS) library. No authentic standard available; concentration reported is semi-quantitative and based on the response factor of the internal standards added to the sample immediately before GC/MS analysis.